THE

MINING CONGRESS JOURNAL

SEPTEMBER, 1920

VOL. VI

SAFETY—EFFICIENCY—CONSERVATION

No. 9

IN THIS ISSUE:

Two New Experiment Stations Established by Bureau of Mines.

Discussion of the McFadden Bill.

Problems Presented by Abolition of Excess Profits Tax.

Solving Alaska Copper and Gold Problems.

Right of Appeal for War Minerals Claimants.

Coal Producers Quit Reporting, Causing Bureaus to Worry.

Mining and Petroleum Digest.

Washington News.

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SEPTEMBER CONTENTS 1920

EDITORIALS.

A Fair Award 393
Mine Safety Work 393
Labor in Business 394
The Value of Business Co-operation . . . 394
Closed Shops 395
Truth About the Farmer 396
Unrest and Progress 396
Pick the Pickets 397
Financial Review of the Month 397
Complex and Simplex Taxation 398

SPECIAL ARTICLES.

The McFadden Bill 400
Denver Convention 402
Abolition of Excess Profits Tax 404
Mid-Year Metal Mining Survey 427
Federal Power Commission Organizes . . 430

NEWS.

Mississippi Valley Experiment Station . . 403
Tuscaloosa Secures Experiment Station . 403
Alaska Copper and Gold Problems Given Attention 426
Power Survey Staff Named 431
Leasing Act Effective Whole Day 432
Sewall's Point Classification 434
Right of Appeal for War Minerals Claimants 436
Organize New Mexico Chapter 437
Two Bureaus Worry 440

MINING AND PETROLEUM DIGEST.

Zinc 410
Copper 410
Silver 412
Petroleum 412
Oil Financing 413
Oil Shale 414
New Fuels 416
Water Power 418
Alaska 419
Economics 420

MISCELLANEOUS.

Public Opinion 424
Trade Practice Submittal 433
John George Leyner 435
Metal Prices Hold 438
Dangers from Explosive Fumes 438
Patents 442
Personals 444

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Coal Products Mfg. Company	Joliet, Ill.	35
Algoma Steel Corporation, Ltd.	Sault Ste. Marie, Ont.	110
Inland Steel Company	Indiana Harbor, Ind.	130
Republic Iron & Steel Company	Youngstown, O.	143
Bethlehem Steel Company	Sparrows Point, Md.	360
Bethlehem Steel Company	South Bethlehem, Pa.	424
Bethlehem Steel Company	Steelton, Pa.	60
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Youngstown Sheet & Tube Company	Youngstown, O.	306
LaBelle Iron Works	Follansbee, W. Va.	94
United Furnace Company	Canton, O.	47
River Furnace Company	Cleveland, O.	204
Brier Hill Steel Company	Youngstown, O.	84
Guf States Steel Company	Gadsden, Ala.	37
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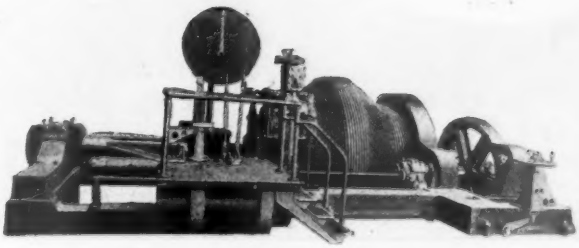

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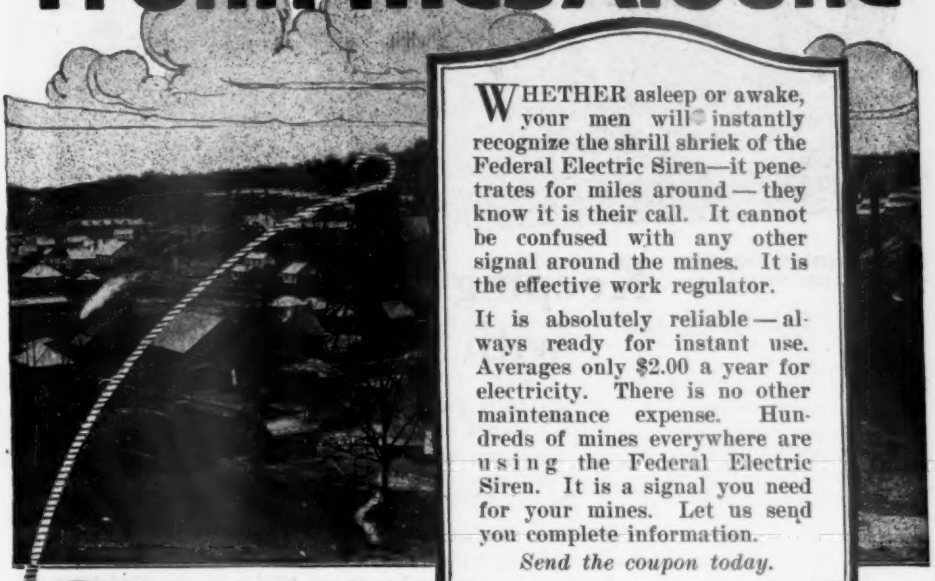

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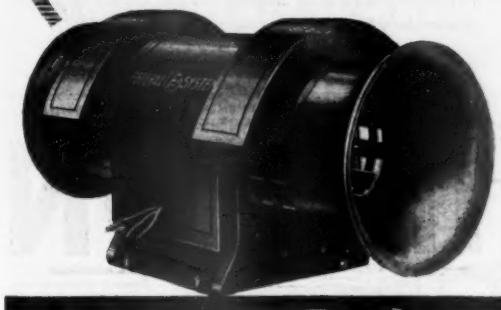

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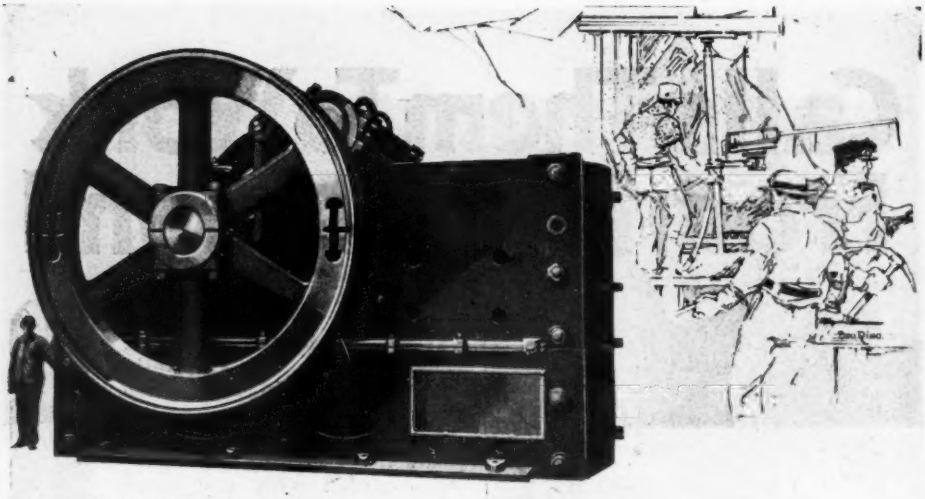

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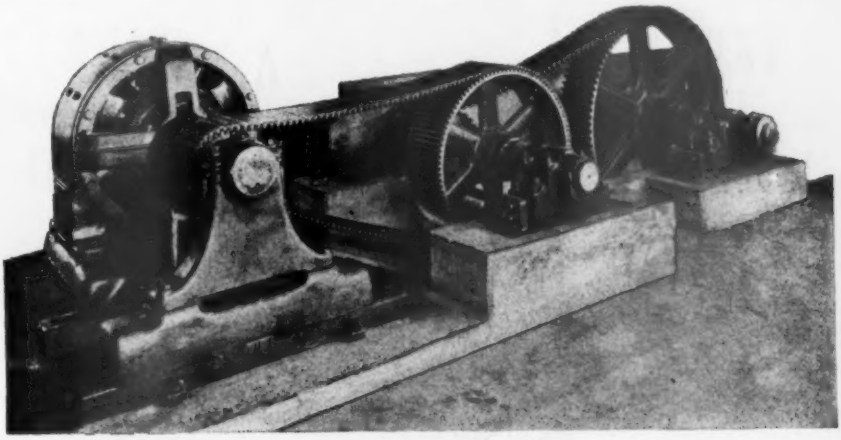

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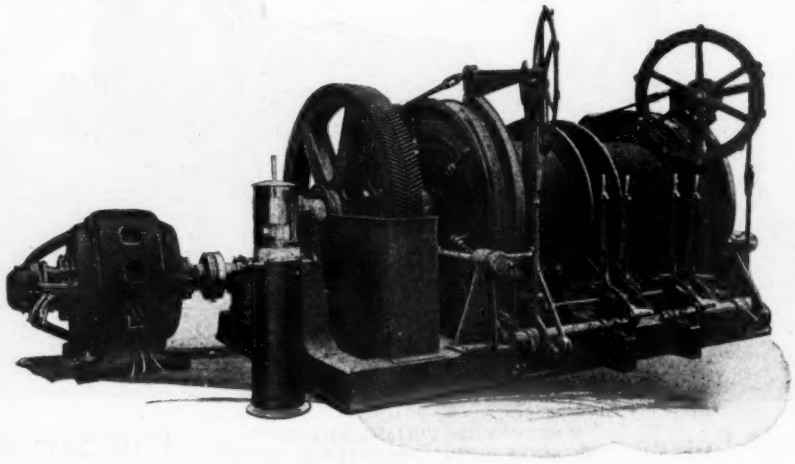

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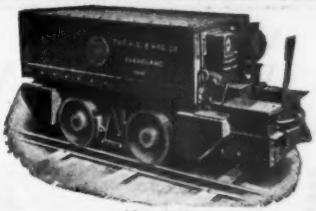

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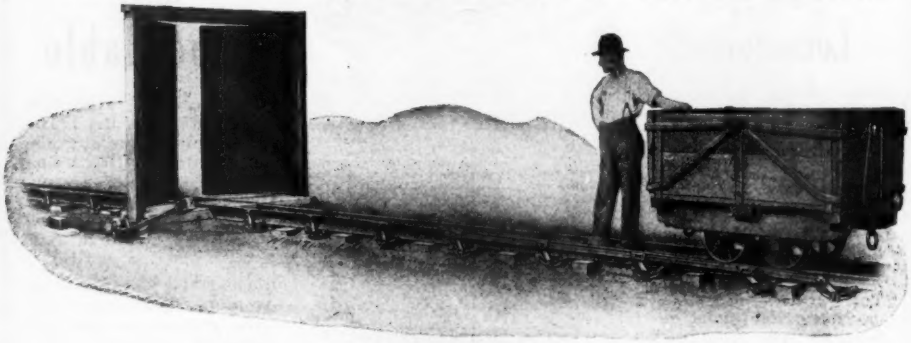

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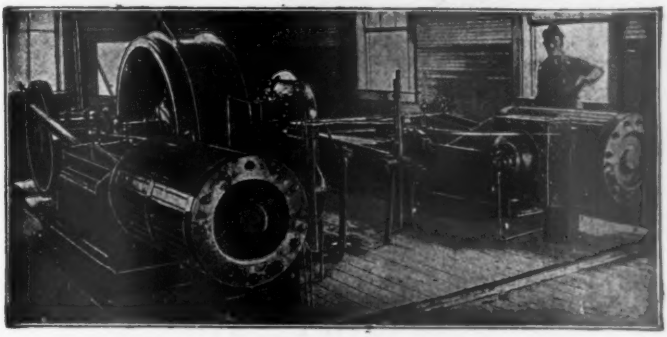

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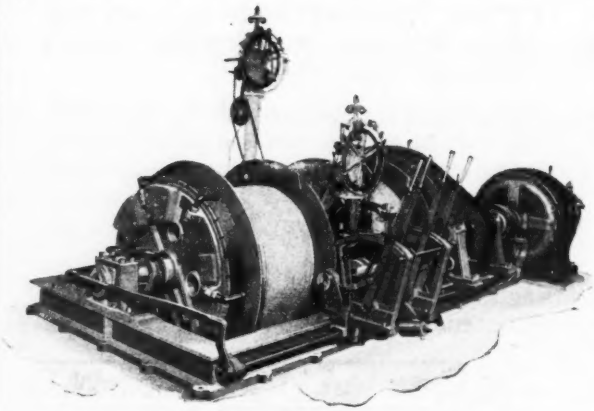

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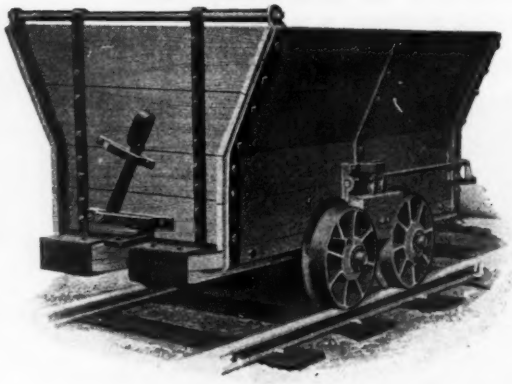

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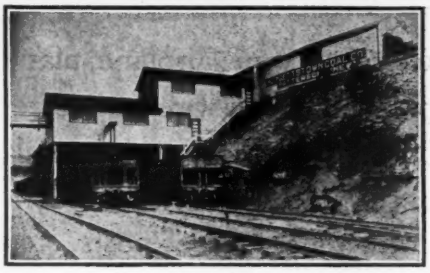

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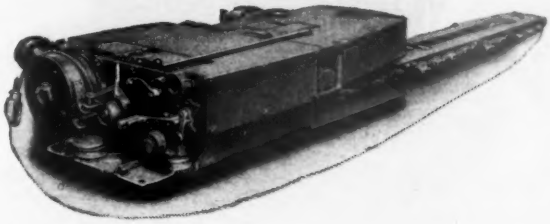

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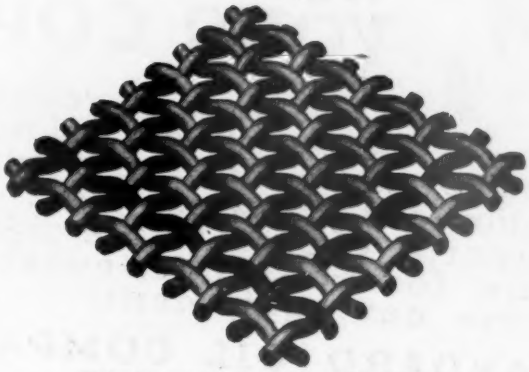

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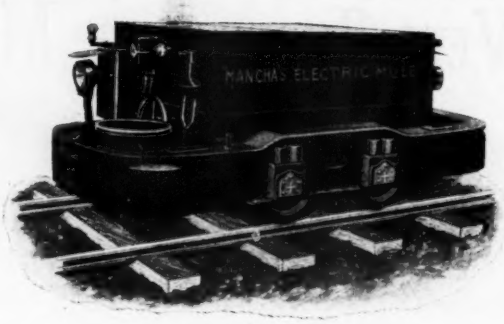

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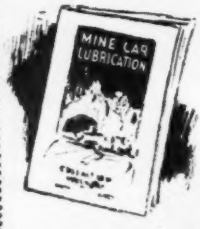

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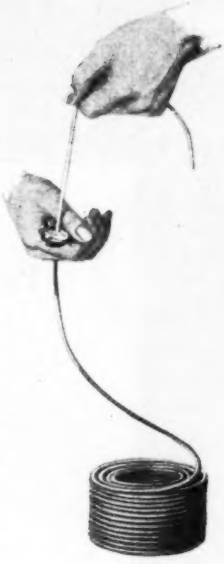

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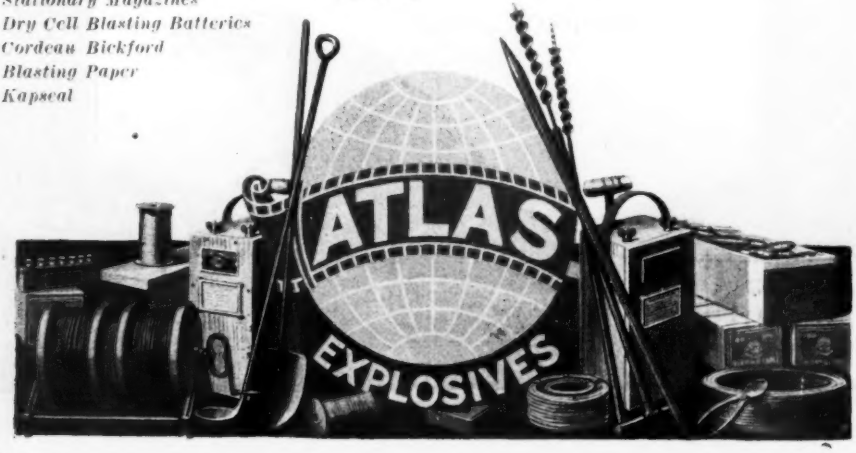

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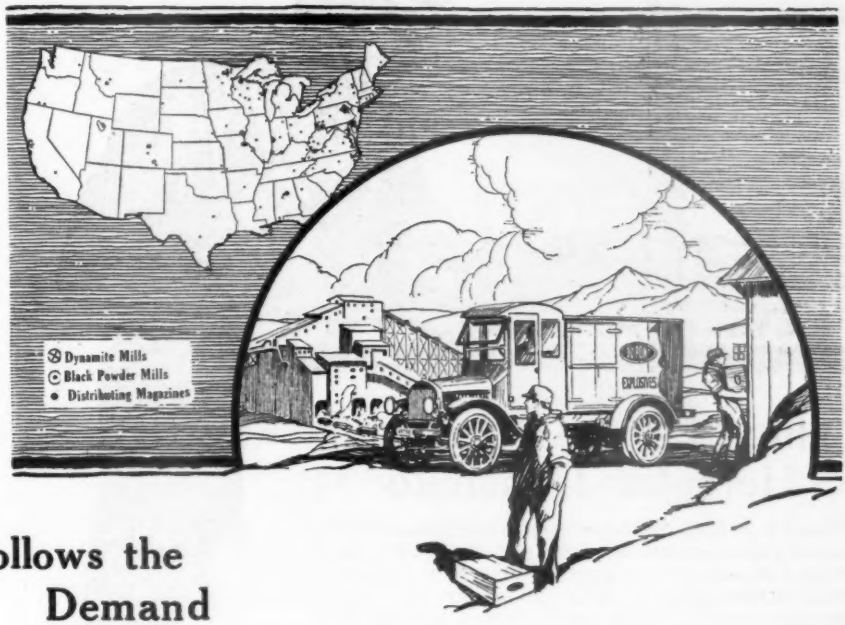

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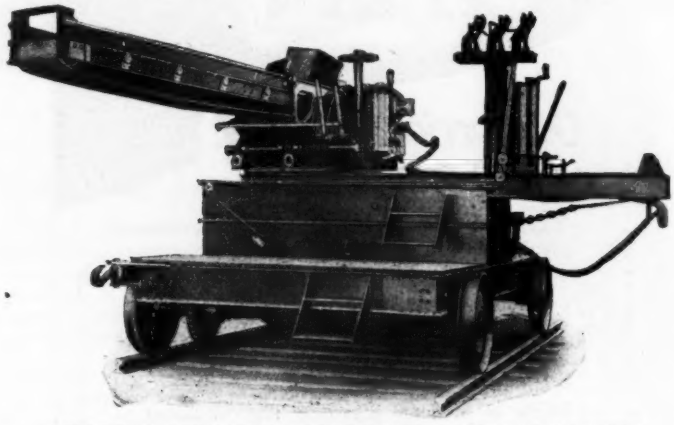

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embody all the advantages of electric drive with an unusually high degree of reliability and economy. They have also demonstrated, to the satisfaction of every owner, their ability to operate continuously under the most adverse conditions.

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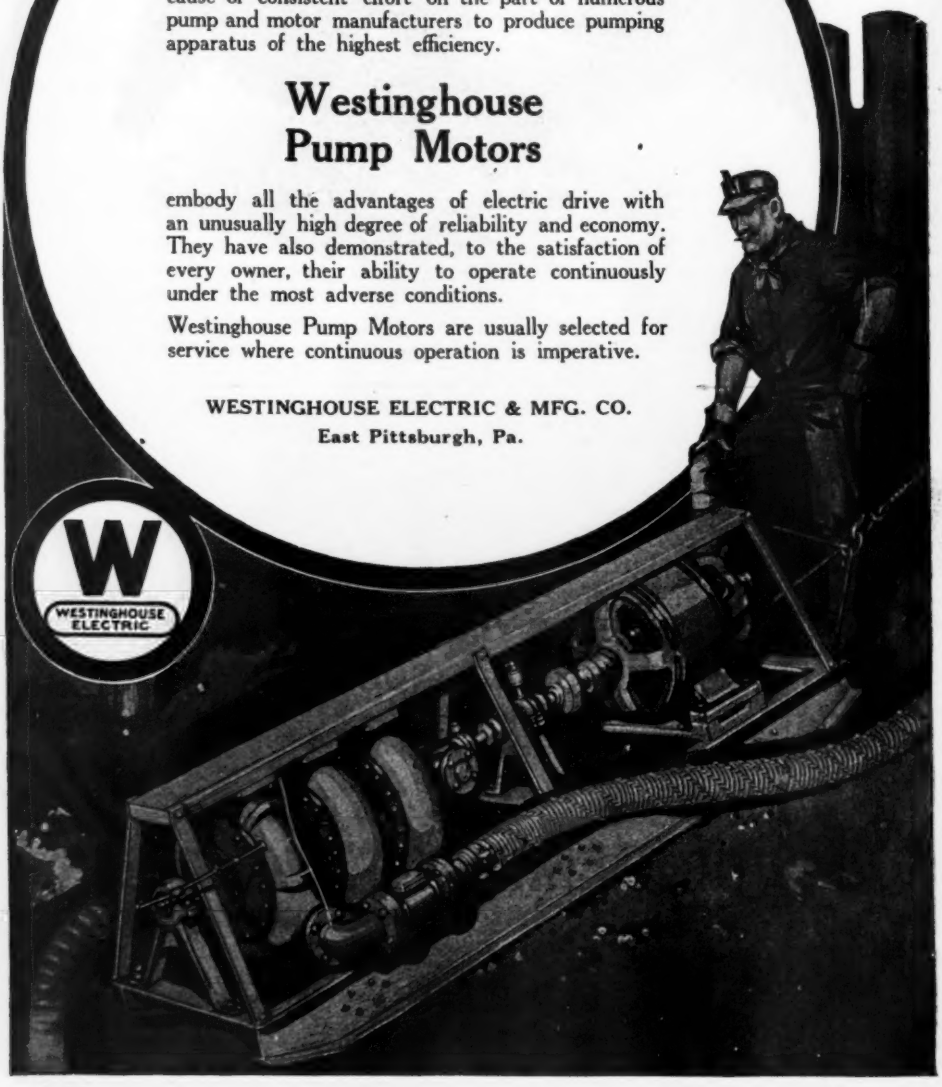

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Business in Washington with any of the Government departments, the American Mining Congress will be glad to serve its active members without charge, in any way consistent with its purposes, either in obtaining information, securing public documents, in advising as to the progress of legislation or in the consideration of complaints.

The American Mining Congress is an organization of service. Write us how we may serve you.

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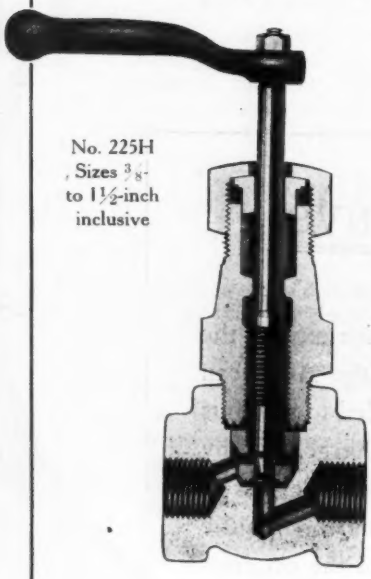

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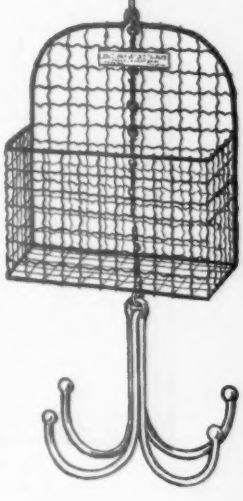
Hang your men's clothes **High and Dry** with the **Union Sanitary Clothes Hanger,** cheapest and best



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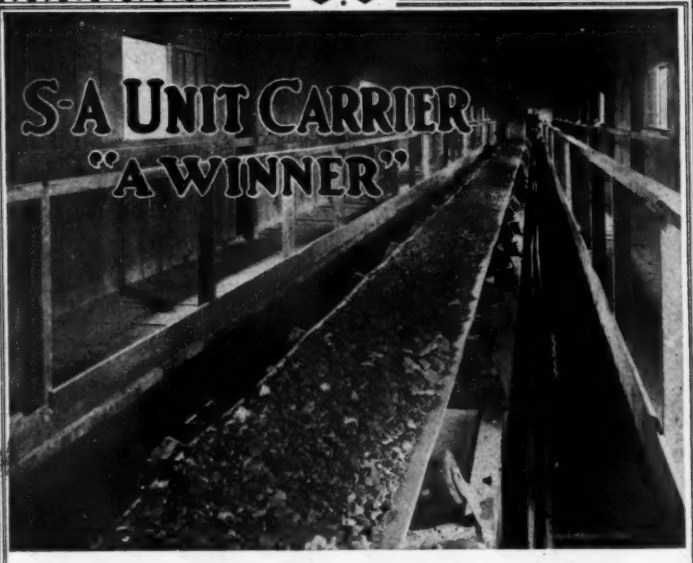

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VOL. 6, NO. 9 WASHINGTON SEPTEMBER, 1920

THE MINING CONGRESS JOURNAL

Official Publication of the American Mining Congress

A FAIR AWARD

The President is to be commended for his vigorous support of the finding of his Anthracite Coal Commission. He is supporting a finding which is sound economically, just to the miners and equitable to the public. The procedure of the commission from the start was characterized by fairness and clear thinking. One of the first indications of this soundess was the elimination by the commission, as a basis for the calculation of fair wages, of anthracite coal. The second indication of straight thinking was the demanding of the consideration of the retail price of basic figures for the generalizations in the Jett Lauck statistics, particularly on increased cost of living. These basic figures were not forthcoming to an extent which proved them to be more than mere generalizations arrived at from an assumed premise. A third point was the quickness of the commission to grasp the difference between the wage scale applicable to the bituminous and anthracite industries, the anthracite workers making the plea that they were penalized in their wage scale by steady employment. The reverse was shown to be the case, namely, that the bituminous workers were of necessity granted a higher wage scale because of the interrupted nature of their employment. In adding to the existing wage scale an increase of 17 per cent. and 20 per cent. to contract workers, the Anthracite Commission has rectified any injustice that existed between the miners, and has limited in so far as is possible the increased burden to the public.

The President could scarcely do otherwise than support a ruling so fair and so unbiased, especially in the face of the present temper of the consuming public.

MINE SAFETY WORK

The *Engineering and Mining Journal* in a recent issue presented an illustration of expenditures by the United States Bureau of Mines, in which it was shown that its general expenses are 7 per cent., mineral mining 10 per cent., experiment stations 19 per cent., fuel testing and petroleum 21 per cent., and mine accidents 43 per cent.

The editor asks, "Frankly speaking, is not this graph a deformed monstrosity?" and urges that "the first thing that should be done is to call in an expert from outside to lay out a program; the second, to have the courage to 'hew to the line,' let the chips fall where they may."

THE MINING CONGRESS JOURNAL fully agrees with the editor of the *Enginering and Mining Journal* that a much larger expenditure should be made by the Bureau of Mines, looking to a more economical and efficient operation of the metal mining industry of the country, and may perhaps agree that too large a proportion of the total appropriations is used for other purposes. It must be remembered, however, that the Bureau of Mines was created by Congress for the purpose of making such investigations "as would increase safety and efficiency in mining operations." During the contest which terminated in the creation of the Bureau of Mines, many and various efforts were needed to retain the word "efficiency," because of the fact that the

principal purpose which Congress had in mind in creating the Bureau of Mines was to prevent as far as possible the loss of life in mining operations. At that time these casualties were supposed to occur almost entirely in coal-mine explosions. The attention of the public was riveted upon the disasters in coal mining, and the Bureau of Mines Bill was passed by Congress in the belief that it would have a tendency to lessen these disasters.

None will be disposed to criticise the efforts made looking to greater safety in mining operations. Such work carries with it the double incentive of sympathetic and humanitarian purpose as well as the prevention of financial loss.

And no one who examines the record will say that from the most selfish pecuniary standpoint the Bureau of Mines has not justified itself. The first appropriation for this work was made by Congress in the year 1907, when the loss of lives in the coal mines of the country numbered 3242, at the rate of 4.81 to each thousand men employed, and the rate of 6.78 per each million tons of coal produced. The number killed in the mines per thousand men employed and per tons of coal produced have been gradually reduced from that time until today. In the year 1916, with a greater production of 110,000,000 tons, the number killed was reduced to 2226, a ratio of 3.09 per thousand men employed, and of 3.77 per million tons of coal produced. From a purely commercial and heartless standpoint, and on the basis of the usual jury award of $5000 each, this saving of 1016 lives was a saving to the country of over $5,000,000, to say nothing of the increase which would naturally have followed the 25 per cent. increase of coal production during the latter year. From every standpoint, the work has justified itself, and the American Mining Congress is proud of the record made by the United States Bureau of Mines in this work.

LABOR IN BUSINESS

The Chicago *Dispatch* announces that the Chicago Federation of Labor has voted to withdraw its funds from the local banks and deposit them in the Non-Partisan League Bank in Bismarck, N. D., to help in financing the wheat harvest. At the same time, it is announced from Cleveland that the Brotherhood of Locomotive Engineers has taken out a charter for a bank with a capitalization of one million dollars, its stock ownership to be limited to Brotherhood members.

Both of these movements are to be highly commended. The solution of the labor problem will not, in the judgment of THE MINING CONGRESS JOURNAL, be made possible by the coercion of non-union members, nor in the effort to prevent work except under the direction of labor unions and upon terms which they may dictate, but rather in such efforts as make for thrift, saving and increased production. Whenever labor shall join the class of the thrifty; whenever each individual member shall undertake to provide from his earnings of today for the rainy day which is sure to come, the independence thus created will give him a different viewpoint as to the right of one man to insist that another shall join a union before he is privileged to earn a living for himself and his family. Let the good work go on.

THE VALUE OF BUSINESS CO-OPERATION

There will be some difference of opinion concerning the recent announcement of a Presidential candidate of his "especial concern for the California fruit industries because they have given to the country a splendid illustration of the beneficent results of highly-organized, well-managed co-operation," stating further that "California's fruits could not have gained the great market and repute they have but for the working of the big co-operative marketing associations on which production, distribution, transportation and financial organization have all been co-ordinated to give service to both producer and consumer at the least possible cost."

There are many who believe that the highly-organized system by which Cali-

fornia fruits have been marketed has in many instances increased the cost of fruit to the consumer to an unwarranted extent, but it will be found that this belief is based upon prices in markets overstocked at the expense of other markets in which no supply was available. It is true that a uniform distribution has been effected; that perishable fruits have not been dumped into markets already overstocked, and that the fruit crop has been so distributed as to make it available to consumers in all parts of the country not otherwise properly supplied. On the whole, the California Fruit Growers' Association has accomplished wonderful results, notwithstanding the fact that its activities border very closely upon a violation of the principles laid down by the Sherman Anti-Trust Law. The complicated machinery necessary to the most efficient production, transportation and exchange of any commodity of widespread or universal use is such as could only be accomplished by the highest and most complete organization of those engaged in the business.

The coal industry needs organization along similar lines. Its disorganized conditions are very largely responsible for many difficult situations which have arisen during the last two years concerning coal production, distribution and exchange. For many years the "open season" for coal organizations was continuous in the Department of Justice; then the exigencies of war required that the Government should demand of coal operators such unity of action as would have made them liable to penitentiary sentences if indulged in prior to the governmental requirement. When the powers which enforced this co-operation turned the coal industry adrift, chaos followed. Notwithstanding the ability of the bituminous coal industry to produce coal largely in excess of possible consumption, different sections of the country have been on the verge of panic for lack of coal, and all sections have been so agitated as to make the market price of coal far in excess of what it should be and would be had proper co-operation been permitted in the coal industry.

The Committee on Commerce, Trade and Commercial Law of the American Bar Association, at its recent St. Louis meeting concerning the Federal Trade Commission and Anti-Trust Laws, recommended that "the law should be amended so as to give authority to the Federal Trade Commission to predetermine actions and give official advice in advance to a business organization as to whether its transactions fall within the prohibition of the Anti-Trust Law." The experiences of the past few years have demonstrated the efficiency of large business units and the necessity of smaller business units being allowed to so cooperate as to compete upon an equal basis with the larger units in supplying the wants of the public. Competition is the life of business. Unregulated competition leads to large units having all the powers which the Anti-Trust Laws were supposed to prohibit. An authorized cooperation between smaller units will make possible proper competition by which small and large units may compete fairly in the open markets of the world.

CLOSED SHOPS

There are two kinds of closed shops—one in which the door is closed against non-union men; another in which it is closed against union men.

In that bitter industrial contest known as the Cripple Creek war a sympathetic strike was called to enforce the closed shop against non-union workers by stopping production of ore which was being treated by a mill operated by non-union workers at Colorado City, many miles away. The result of this contest was the loss of many lives, the destruction of much property, and finally resulted in a different order of closed shop—one in which the door was closed against union workers.

The recent street-car strike in Denver has resulted in the destruction of much property, the loss of six lives, the wounding of many others, and will result in an

open shop where the closed-shop principle applied before. **The right of any citizen to accept employment and earn a living for himself and family without reference to membership or non-membership in a labor union is a right which cannot be successfully disputed.** The adoption of this fundamental principle means an open shop. Labor unions insist that union men cannot work side by side with non-union men, and that the open shop is therefore impractical and impossible except by the sacrifice of labor unions; that if no advantage shall accrue to the member of the union it would be useless to expect him to pay dues, without which the organization could not exist. THE MINING CONGRESS JOURNAL does not believe this to be true. A labor union, without insisting upon a closed shop, may render many and valuable aids to its members. The contributions required would be very much less, and its services might be even more valuable were it spared the expense necessary in its contention for the closed shop.

The first serious objection to the closed shop is that it denies the right of citizens to earn a living and at the same time maintain their independence of action.

Second, it destroys efficiency in management, in that the workman may rely upon the union to protect his job rather than the good-will of his employer, which, as a rule, depends upon the value of the service rendered. A decrease in efficiency of service means an increased cost of living, which necessarily reacts upon the worker and reduces the purchasing value of his wages. Labor unions have accomplished much of good. They have, directly and indirectly, been responsible for very much of harm. The contest for the closed shop has resulted in enormous loss of wages, enormous destruction of property, enormous loss of life. These great losses were the result of the exercise of power without responsibility, which canont be exercised without jeopardizing the stability of the Government to which both employer and employe must look for the protection of their liberties.

TRUTH ABOUT THE FARMERS

The American Federation of Labor has from time to time publicly proclaimed that the farmers' organizations of the country were combined with the American Federation of Labor in the present political campaign. Unless the Farmers' Equity Association and the Non-Partisan League shall be counted as farmers' organizations, the assertion is incorrect. Real farmers' organizations do not consider such associations as anything but political, radical, union movements. The following editorial from the *Agricultural Review*, official organ of the International Farm Congress, and published in Kansas City, gives a more exact statement of the attitude of the farmers regarding affiliation with organized labor:

"This much has been demonstrated conclusively by the numerous meetings and conferences of the farm organizations throughout the United States recently:

"1. The farmers are opposed to Government ownership or operation of public utilities, or the 'nationalization of industries.'

"2. The farmers will not resort to the strike as a means of compelling people to pay higher prices for their products. They may restrict the production of a commodity of which there is a surplus, but this merely means an increase of some other and needed commodity.

"3. The organized farmers will not enter into any agreement with organized labor designed to enforce arbitrary demands upon the general public.

"4. Farmers will not look with favor upon any vocational political plan or movement.

"5. The farmers are organizing more strongly than ever before, and will use all their means to protect their interests. The various farm organizations are going to co-operate, but not consolidate.

"There are a few farm organizations who do not see things in this light, but they are local or sectional in scope, or political in character. Their membership and influence is comparatively small."

UNREST AND PROGRESS

It is unfortunate that the most valuable of life's lessons come through bitter experience. Every effort for better conditions must necessarily break through a crust of resistence. Every high development comes as a result of persistent effort, and usually the more strenuous the

opposition, the more valuable the result obtained by its overthrow.

The industrial unrest of the world is not altogether a calamity, even though here and there by mistaken effort it shall produce a calamity. The word freedom has ever been a call to which all subscribe and most people rally, but experience demonstrates that in the civilized world there is no freedom without restraint; there is no desirable freedom except there be forces by which that freedom can at all times be protected. In other words, a government upon which we may rely for protection and to which we shall surrender such freedom as interferes with our neighbor's right must be maintained. The breaking down of an established government is a serious matter which more often than not results in disaster for those who undertake its overthrow. Upon the other hand, great advances toward human liberty have been accomplished by the overthrow of the then constituted governments wherever a better government has taken its place. It is difficult for the average citizen of this country to believe that the terrible convulsions which now affect Russia can lead to else than disorganization, and perhaps to anarchy; and yet it is barely possible that the turmoil, disaster, starvation and want which have been suffered in that distracted country will culminate in a stable government, the greatest earthly blessing of the human race.

PICK THE PICKETS

Toledo, Ohio, has a judge who is certainly direct in his methods. Toledo, you will remember, has suffered disastrously from strikes. The unbroken strike against the Pope Motor Car Co., almost twenty years ago, drove from Toledo all the motor-car companies which would have made this ideally located industrial and transportation center the center of the motor industry rather than Detroit had they not been deterred by the triumph of the strikers, who closed and bankrupted the Pope works.

When the Willys-Overland Company, which has as the nucleus of its plant the old Pope factory, underwent a similar strike this year, the strikers appealed to Judge Killits for permission to picket the works. The Judge granted this permission, with the proviso that he be allowed to pick the pickets. These pickets were forbidden to interfere with the orderly going and coming of the working employes of the motor company. They were placed at the gates to preserve order, and none of the usual brickbats or epithets were in evidence. As a result the strike was short-lived, and the works are now running full blast—a most encouraging sign in a town when the reverse has been the usual outcome.

FINANCIAL REVIEW OF THE MONTH

In a market weak and dull all prices sagged steadily through the first part of August until August 9, on which day many industrials made new low records for the year, U. S. Steel common getting as low as 83⅞. General Motors also got under 20 on this day. As this was the heaviest day's business of the month, it bears out the suggestion of last month that any large volume of business would have to be on a downward scale.

This rapid decline was particularly noticeable in the oil stocks. While the Mexican stocks were the strongest, those of companies whose largest holdings were within the United States depreciated rapidly, Middle States Oil dropping from its recent low average around 20 to 10⅝ in one session, a loss of half its value. In the upturn which followed these low records, the forward movement was vigorously assisted by the announcement of the Standard Oil Co. of New York of a 200 per cent. stock dividend. This caused a large advance in all the Standard Oil group, and other oils advanced in sympathy.

The gradually increasing favorable sentiment in the rails helped to bring the market back from these low levels by varying degrees until at the close of the month Steel is hovering around 90, and Baldwin Locomotive from its low of

100⅛ on August 9 advanced to 110, which price did not hold, however, dropping back to 106 to 107.

There is no question but that while the effect of the Polish situation on the market was largely a sentimental one, the removal of the Red menace from Warsaw helped to stimulate the price advance which set in after the first half of the month.

The general trade conditions show a slight change for the better, and the demand for money to carry the crop movement has not yet reached its peak. The new offering of Treasury certificates came as something of a surprise to the banking interests, and it is apparent the Government is calling for this money to avoid putting a further strain on the resources of the country during the heavier crop movement later in the fall. These certificates are under date of August 16, running a year, and bear interest at the rate of 6 per cent. The improvement in transportation has assisted the outlook for fall crop movement as much as the drastic Federal Reserve policy.

It is apparent that if the reason for the policy of the Federal Reserve System has been to lower the volume of Wall Street loans, its purpose has been accomplished, because Wall Street loans were never so liquidated as they are at present. They are not only much smaller than the volume of loans prior to the World War, but in relation to the value of securities traded in Wall Street they are lower than they have been in fifty years, possibly lower than they have been since the Civil War.

Commodity prices are steadily decreasing, the decline in wheat, sugar and coffee having been spectacular during the past month. There is no prospect of easier money rates on any increased volume of business on the street, however, until after the end of the crop movement in the fall.

The credit position as a whole is slightly improved. The sentiment toward the credit position is more so. But both the credit position and the sentiment will have a heavy burden to bear in the fall crop movement. The credit reserves for these movements are certainly not large. To imagine that the West can handle this crop movement without the aid of Eastern financing is to imagine a crop production of one-third of our present yield, which in almost every item will be one of the largest in history.

When distributed, this immense crop will mean prosperity, as it will result in a disbursal of funds among the producers and the lowering foodstuff prices among the consumers.

The stockholders in many industrial companies are due for a slight shock on reading the next fiscal statement. The reduction of inventories with the shrinkage in value, particularly in companies having large stocks of leather, woolens and nonperishable foodstuffs, will cause some losses in the profit and loss statement which will not be pleasing.

The motor companies issue reports of entire absence of depreciation in this industry. While it is true that there is no danger to the motor industry, yet at the same time their steel orders indicate that they are not doing the business they had planned on for the current year. The prices of motor cars show no offset, nor can any great cut in price be expected until their basic metal components have further declined.

The factors showing improvement are:
Transportation.
Foreign affairs.
Credit.
Crop conditions.

The factors to offset any material present advances are:
Decreasing commodity prices.
Decreasing foreign demand.
Necessity of funds for crop movement.
Increasing imports.
Increasing foreign competition.

COMPLEX AND SIMPLEX TAXATION.

This issue of THE MINING CONGRESS JOURNAL contains the first of a series of articles on Federal revenue law revision,

prepared by the Chief of the Tax Division of the American Mining Congress. The general sales tax is discussed.

The process of eliminating the excess profits tax and substituting a generally acceptable code is not a simple task. As a matter of fact, the terms "simple" and "equitable" in the actual practice of collecting taxes are found to be contradictory. It is now quite apparent that a "simple" tax which will produce sufficient revenue to meet even half of the Government's fiscal requirements cannot be attained without causing serious inequities.

The business structure of this advanced nation of ours, solid as its foundation, has expanded into a labyrinth of delicate and easily disturbed mechanism. Experience with the recent revenue laws has demonstrated that a system of taxation theoretically simple can carry in its wake, if not actual business destruction, a profound disturbance of economic welfare. However attractive the attainment of sweet simplicity, the application of a single smooth principle to billion-dollar taxation precludes any dependable degree of equitable assessment unless the process thereof is by law so constituted that latitude and elasticity are specifically provided. This raises certain complications and administrative difficulties, but more or less involved provisions for relief from exceptional hardship will always be necessary to restrain sharp practices. It does not mean, however, a repetition of the intellectual sufferings provoked by the excess profits tax.

There is some hope for modification and simplification of even the underlying features of the income tax, which has such equity of principle and in the complete analysis such relative equity of operation that dependence upon it for a fair proportion of revenue will continue. The adoption of additional excise taxes and the stabilizing of rates will undoubtedly provide means of eliminating some complex ramifications of the income tax heretofore necessitated solely because of their temporary large revenue-producing functions.

It is to be regretted and acknowledged with reluctance that the results of searching investigation of probable effect has robbed the sales tax, most discussed of new proposals, of much of the simplicity and equitable effectiveness claimed by its advocates. It may yet be adopted in some modified form, but in any event the trend should be toward practicability and equitableness, and last but not least the instant obliteration of anything that smacks of temporary expediency. The economic urge toward standardization is applicable to taxation by the Government of the United States.

UTAH CHAPTER RATE PROTEST HEEDED BY STATE COMMISSION

Following the filing of a protest before the State Public Utilities Commission by the Utah Chapter of the American Mining Congress, the commission announced a decision that the 25 per cent. increase applied by the Interstate Commerce Commission to all interstate shipment in Mountain-Pacific territory would not be levied against coal and ore shipments wholly within the State of Utah.

The refusal to grant the increases sought by the railroads was the direct result of the united action of Utah operators speaking through the Utah Chapter of the American Mining Congress. The Utah Chapter protested that increased rates, especially on low grade ores, would close many mines in the State.

The case was brought before the commission by the railroads, who asked that the recently authorized interstate rates be made effective on intrastate shipments. Except as to ores and coal, the petition of the carriers was granted by the commission.

A. E. Wells, engineer of the Bureau of Mines, who is recognized as an authority on the subject of smelter fumes, has been assigned to handle non-ferrous problems which have reached a semi-commercial stage. In the words of Dorsey A. Lyon, supervisor of stations, he will "translate laboratory results into commercial work." His experimental and research work will be conducted on a semi-commercial scale at commercial plants. His first work, in connection with the volatilization of low grade oxidized lead and zinc ores, and upon the performance of which he has already entered, is in co-operation with the Yellow Pine Mining Co., Good Springs, Nev., which work has been developed up to its present stage by members of the bureau's station at Salt Lake City, under direction of Superintendent Thomas Varley.

THE McFADDEN BILL—H. R. 13201

NOTE.—In a letter to Congressman Benjamin K. Focht of Pennsylvania, Secretary of the Treasury Houston reiterated his opposition to the McFadden Bill authorizing payment of a premium for newly produced gold and levying an excise tax on gold used in manufacturing, describing the measure as one designed to subsidize the gold-mining industry. H. N. Lawrie, economist and chief of the Department of Precious Metals and Rare Minerals of the American Mining Congress, in addresses delivered before the gold producers and bankers of California Colorado, Utah and South Dakota, and in interviews sought by leading financial publications, has defended the McFadden bill as one essential to the maintenance of an industry indispensable to the financial security of the nation. The following review of this legislation by Mr. Lawrie, in which he forecasts early passage of the bill, is a complete exposition of its purposes and methods of accomplishment.

By H. N LAWRIE.

Legislation designed to protect the monetary gold reserve of the United States from industrial depletion probably will be enacted at the next session of Congress. The bill introduced in the House of Representatives by Representative Louis T. McFadden of Pennsylvania, chairman of the Banking and Currency Committee, has been reported upon favorably by the Federal Legislative Committee of the American Bankers' Association and many financiers regard the legislation as necessary to correct a situation which is menacing to the financial security of the nation. The McFadden bill creates the machinery whereby the industrial consumers of gold may pay more nearly the cost of production for their raw material and in no way affects the monetary status of gold. The jewelers and other consumers of industrial gold are now being subsidized by receiving their raw material from the mint at the prewar price.

A free gold market is maintained under the provisions of this bill, for the reason that the excise is collected upon the manufactured article as sold, and not upon the bullion. The consumers of industrial gold will continue to purchase their raw material from the mine at the free gold market price of $20.67 an ounce.

This bill does not change the number of grains of gold in the dollar, and, therefore, does not change the monetary unit.

Value of Dollar Shrinks.

Compared to 1914, purchasing power of the dollar, in terms of all commodities as compared to 1919, was 47 cents. The gold producers' ounce in 1914 had a purchasing power of $20.67, whereas during 1919 it could purchase in terms of all commodities but $9.70.

This is the most important reason why gold production in the United States declined from $101,000,000 in 1915 to $58,500,000 in 1919, and from present indications will probably still further decline to not to exceed $40,000,000 during 1920.

The McFadden bill is a revenue producer and lessons the tax burden on the public. Had it been in effect during 1919, it is estimated a revenue in favor of the Treasury and in excess of expenditures provided under the act would have amounted to $14,000,000. From present indications it is probable the production of new gold will not exceed $40,000,000, and from record of sales of gold for consumption in manufactures and the arts it is probable $90,000,000 of gold will be consumed for industrial uses this year, which would create a balance in favor of the Treasury of $25,000,000. Since the tax is imposed on consumers of industrial gold, it does not fall on the public, but largely on consumers of jewelry, a luxury, who will pay more nearly the cost of production for their raw material, thereby lessening the subsidy they now enjoy.

Immediate Relief Needed

It is important to keep the gold mining industry alive, for fear that with the greatly reduced production there will be difficulty in retaining the gold standard during a popular campaign for credit restriction, accompanied by declining prices. The gold mining industry will be completely shut down unless constructive aid is provided without delay. Continued depletion of the gold stock by excess exportation and industrial use will seriously impair the public confidence in the nation's finance and currency unless a normal gold output is assured.

If a healthier gold mining condition prevails during the period of currency deflation public confidence will be unshaken and a world financial crisis will be averted.

If the gold mining industry is permitted to

shut down, it will take years to develop a normal output at a very much greater cost. The time to act is now, before the industry becomes dead and deep mines are filled with water.

In reply to the opposition of the Treasury Department, Representative McFadden said to the Committee on Ways and Means:

No Subsidy for Producer

"Treasury officials have taken a premature stand in opposition. Secretary Houston has stated that he objects to the premium proposed because it constitutes a subsidy, to which the Treasury is ever opposed. Evidently he does not realize he is subsidizing consumers of gold in jewelry and for other industrial uses to a larger extent that the premium proposed. There is no net subsidy to the producer under this act.

"The secretary appends a report by a committee, at head of which was Albert Strauss, former member of Federal Reserve Board, who opposed any stimulation in production of gold, saying a checking in production had been occasioned by war causes, which would disappear as the war receded further. Economic pressure experienced by the gold-mining industry with attendant high prices for labor and material would cure itself in time.

"The war is vanishing into the past, but for all that prices for material and labor have greatly increased since the armistice and pressure on the gold-mining industry is even greater than at that time. Furthermore, when this report was prepared there was an embargo placed on exportation of gold and restrictions with reference to its industrial use. Since presentation of this report the embargo has been lifted and restrictions removed, thereby occasioning a loss to the monetary gold stock of the United States of $445,800,000 from May 1, 1919, to May 1, 1920, by excess exportation and consumption in manufactures and the arts greater than amount produced from our mines. Meantime the gold-mining industry is approaching rapidly the vanishing point. It is surprising to find any opposition in the Treasury based on such premises. It is complaining of its huge deficits. The excise proposed will be collected at no considerable expense to the Treasury. The excise will not only pay for the premium, but will leave a substantial balance of $15,000,000 or $20,000,000 annually, to be paid into the general fund of the Treasury.

"In a letter submitted by California Metal & Mineral Producers' Association to the Railroad Commission of California, Secretary Houston, on April 1, 1920, stated the following:

"'The Treasury would, under present circumstances regret to see any steps taken tending to interfere with production of gold, which even now is on a much diminished scale. It is, of course, impossible for the Treasury to judge of the respective importance of conflicting needs of your community for power, and it must, therefore, confine itself to the statement that it would regard as unfortunate anything that would further curtail gold production.'"

"I would only ask that this letter be contrasted with the statement in the later letter by the Secretary.

"If the Treasury regard the declining gold output as unfortunate, and are opposed to constructive relief afforded in this bill, they should present a proposal which would effectively maintain a normal gold production during this period of economic stress."

World's Machinery Oiled

Decidedly the most noteworthy feature of the petroleum situation as reflected in an analysis of production and consumption for the first six months of 1920 is the increased production and consumption of lubricating oils. Such an increase means literally that the "wheels of commerce" have begun to grind again. It signifies beyond dispute that reconstruction is going on apace both in Europe and America.

Exports of lubricating oil showed an increase during the first six months of 1920 four times greater than the increase of the first half of 1919 over the comparative period of 1918. Domestic consumption of lubricants was even more satisfactory, for whereas there was a decrease during the first half of 1919 as compared with 1918, there was a considerable increase during the first half of the current year not only as compared with 1919, but also as compared with 1918, when American factories were all busy on war orders. American industries reached the peak of their production while filling war orders, and the fact that American factories were consuming more lubricating oil during the first half of 1920 shows conclusively that production was going forward by leaps and bounds.

The figures offered by the Bureau of Foreign and Domestic Commerce show 630,044,311 gallons of lubricating oil, stock on hand January 1, 1920, and production for the first six months, as compared with 548,757,787 gallons in 1919, and 546,120,973 gallons in 1918, with exports of 206,915,840 gallons, and domestic consumption of 206,565,804 gallons in 1920, as against 147,695,436 gallons exports, and 224,313,032 gallons domestic consumption in 1919, and 127,404,845 gallons exports and 259,049,187 gallons domestic consumption in 1918.

New Mine Rescue Truck

The Bureau of Mines is having constructed the most complete mine-rescue truck ever made. Its interior arrangement will be such that rescuers can move about without any inconvenience and can handle a larger number of injured people on stretchers more easily. The Bureau now has ten mine-rescue railroad cars and six automobile trucks. The new truck will be the seventh.

DEVER CONVENTION TO BE BUSINESS GATHERING

The preliminary draft of the official call for the twenty-third annual convention of The American Mining Congress has been submitted to the directors for consideration and early release to the public. In past years it has been the practice of The American Mining Congress to invite the chambers of commerce, local and State officials to appoint groups of delegates to the Mining Congress Convention. This year, owing to the peculiar conditions pertaining in industry affecting production, marketing, development and labor, and the legislative program in Congress, the directors of the Mining Congress have considered the advisability of limiting participation in the Congress to producers of minerals, oil, coal and those financially interested in these projects. The twenty-third annual convention will therefore be a purely business meeting so organized that its discussions can be frank and open and its conclusion practical and concrete.

The official call, which will be published in the October issue of THE MINING CONGRESS JOURNAL, will provide for national conferences on taxation, standardization, industrial relations, legislation, gold, war minerals, petroleum, coal, flotation, etc. The first national conference to be called by the newly organized division of Schools of Mines and Metallurgy will hold two or three sessions. The organizing committee for this section consists of Profs. G. M. Butler, Tucson, Ariz.; F. C. Lincoln, Reno, Nev., and Francis A. Thompson, Moscow, Idaho. This committee will issue a special call inviting the officers, faculty and trustees of all schools of mines, metallurgy and engineering, State directors, inspectors and commissioners of mines and mining to meet together on this occasion for the purpose of considering the general welfare and progress of the educational movement in connection with mining and getting better acquainted with the operators themselves.

The flotation conference will be the first national meeting ever called by users of the flotation processes. At this conference not only legal, but technical and mechanical developments in connection with this method of ore recovery will receive attention.

Probably one of the most important divisions of work during the Denver convention will be the National Conference on Standardization, which will be called by a special committee on organization representing the permanent Standardization Committee of the American Mining Congress. Decision will be made later as to what extent the discussions shall be carried, but it is probable that the national conference will include the standardization of mining machinery and equipment, methods of production, handling of labor, transportation, marketing and accounting.

An international conference on Mexican-American relations will call together a large number of representative business men from both countries for the purpose of discussing a basis of settlement of political and commercial problems which have long existed and making possible more satisfactory co-operation between the two peoples.

Assurances have been received from the officials of the National Association for the Protection of American Rights in Mexico and from Dr. Fernando Iglesias Calderon, Mexican High Commissioner in Washington, that there will be full and complete co-operation internationally. There will be assembled a sufficient number of representative business men to consider an intelligent and satisfactory program for presentation to the Governments of both the United States and Mexico, a program by which the long-existing and perplexing conditions may be adjusted.

An advisory committee is now being selected to pass upon the program, and, following the very constructive and helpful suggestion of Editor Spurr of the *Engineering and Mining Journal* some months ago, an effort is now being made to find a plan under which there can be a preliminary organization of a Resolutions Committee which will give thoughtful consideration to suggestions which may be placed in their hands previous to the convention in Denver. This latter suggestion, now being considered by the directors of The American Mining Congress, will be a revolutionary movement so far as conventions are concerned, but, owing to the fact that The American Mining Congress is now the recognized mouthpiece of the mining industry, and that its resolutions when presented to the public and to legislative bodies are given careful consideration, it is believed that there should no longer be followed the old plan of haphazard and hurried consideration of the various important suggestions which come before such a body.

From every viewpoint it would seem that President Wells and the directors of The American Mining Congress are organizing the twenty-third Annual Convention along lines which will assure the enlarged influence of The American Mining Congress in public affairs.

A request is made that all communications pertaining to the Denver convention, the various conferences to be held in connection therewith and the exposition, shall be addressed to Convention Headquarters, Albany Hotel, Denver, Col.

MISSISSIPPI VALLEY EXPERIMENT STATION GOES TO ROLLA, MO.

The new Mississippi Valley Experiment Station of the Bureau of Mines has been located at Rolla, Mo. Its laboratory and investigation work will be carried on at the Missouri School of Mines and Metallurgy. Its central offices will be located in or near St. Louis. The decision of Dr. F. H. Cottrell, director of the Bureau of Mines, to this effect has been approved by Secretary of Interior Payne.

For a long time the Bureau of Mines has desired to take up, in co-operation with the mining and metallurgical industry, those problems met with in the Mississippi Valley, where lead and zinc deposits occur. As is well known, the ores of this district are for the most part sulphide ores, and are ordinarily not difficult to treat. However, there are also large deposits of oxidized lead ores in certain districts of Missouri, and their mining and metallurgical treatment presents a serious problem. Concentration by gravity methods had been tried for years on these ores, and there are many thousands of tons of high-grade tailings, as well as crude ore, awaiting proper methods of recovering metallic values. Such being the case, the bureau will carry on such research and investigational work in connection with the treatment of these ores as will assist in the development of processes which will prevent their being wasted, due to the lack of a metallurgical process which it may be commercially feasible to apply to them.

TUSCALOOSA LANDS EXPERIMENT STATION FOR THE SOUTHEAST

The Bureau of Mines experiment station for the Southeastern district, including the States of North Carolina, South Carolina, Georgia, Alabama and Tennessee, has been definitely located on the grounds of the University of Alabama, with field headquarters and offices in Birmingham. Simultaneously with the announcement to this effect, Dorsey A. Lyon, Chief Metallurgist, stated that he hoped in time to see another station located somewhere in the South.

It was at first intended that this should be a non-metals station, but with its location decided upon, its exact functions remain to be definitely determined. George S. Rice, Chief Mining Engineer, and Dr. R. B. Moore, Chief of the Division of Mineral Technology, conducted the preliminary investigations which resulted in the location of the new station at Tuscaloosa, Ala. Dr. F. G. Cottrell, Director of the Bureau of Mines, left on August 23 for the Southeastern district to investigate the various problems confronting the new station, and he expects to make announcement during the week of September 20 of its exact functions.

Work at Tuscaloosa will be done under a co-operative agreement which has been entered into by the Bureau of Mines and the University of Alabama. This agreement is similar to those which have been entered into between the Bureau and State universities elsewhere. The university will furnish living quarters for the station's staff in Comer Hall, and all necessary offices, including light, heat and power. The institution will also bear expense of alterations.

Such investigations as relate to Alabama problems will be under the joint direction of the Bureau of Mines and President George H. Denny of the university. The Bureau of Mines engages to spend about $23,500 during the first year.

"RENO STATION CRITICISMS NOT JUSTIFIED," LYON SAYS

It is understood that there has been considerable disappointment in Nevada over the announcement that the work of the station at Reno would be confined to rare and precious metals. It was hoped that oil shale could be included in the work of this station. The objection raised caused Dr. D. A. Lyon, supervisor of stations, to issue a statement to the effect that "it will be impracticable for each station to attempt to give attention to all of the problems which occur in the district in which it is located. However, there may be many problems in Nevada which are more important to the State than those relating to rare and precious metals, but if each station were allowed to handle all the problems of the State there would be much duplication of effort among the experiment stations."

Dr. Lyon further states: "As for oil shales, the Bureau of Mines already has taken up research and investigation work at its station at Salt Lake and is carrying on special work in co-operation with the State of Colorado at Boulder. The results of experimental work, while done outside of Nevada, will be applicable to that State as well. With the bureau's limited appropriations and the necessity for having specialists for each line of work, it is important that each station devote itself particularly to one problem of the industry."

Marble in Guatemala

The American Consul at Guatemala City reports that the Guatemala Marble Mining Company is preparing to operate a marble quarry about 13 miles from the railroad station of Zacapa, which station is a little over 100 miles from Puerta Barrios, the nearest port from which the product may be shipped. The deposit is extensive, and though somewhat broken up in places, great quantities of sound marble are available. It is claimed that the marble is equal in quality to the best product of the Italian Carrara quarries.—U. S. Bureau of Mines.

ABOLITION OF EXCESS PROFITS TAX PRESENTS DIFFICULT PROBLEMS

By Robt. G. Wilson
Chief of the Tax Division of The American Mining Congress.

In addressing Congress last December the President expressed his trust that immediate consideration would be given to the problems of future taxation.

The Secretary of the Treasury has since informed the Chairman of the Committee on Ways and Means of the House that he contemplated with gravest apprehension the continued delay in a thorough revision and fundamental simplification of the income and profits taxes. "Public opinion," declared Mr. Houston, "has not awakened to the gravity of the consequences which are likely to follow a failure to simplify the law."

The revenue laws were not revised at the recent session. There is apparently no possibility of relief for the taxable year 1920.

The most that now can be expected is decisive action on the part of Congress between its assembly on December 6 next and its adjournment on March 4, 1921. Commencement of the task immediately upon convening is manifestly imperative. The new laws, to become effective during the taxable year 1921, must be enacted without further delay. There has been a surfeit of retroactive revenue legislation Public opinion, mindful that occasion no longer exists for anomalous contrivances that have wartime expediency as their sole motive and warrant, is not likely to permit any considerable pre-enactment levies. Apart from this consideration is the more tangible fact that the substitutes for the present undesirable tax codes will be of a design that will make their retroactive application exceedingly difficult, if not actually impossible.

The business organism of the United States is too complex to permit any honest hope that more than a relatively equitable and simple tax, capable of meeting the now enormous demands of the Government, can ever be devised, but improvement by comparison is so essential, and, in fact, so feasible, that any political or other consideration which postpones the relief cannot be condoned.

The confusion, business harassments and economic effects have been increasing with such cumulative intensity that it is with genuine concern and uneasiness that both Government officials and the thinking public are viewing the multiplying dangers. There are many industrial and social problems in those days of economic stress and alien dogma that apparently must wait upon natural adjustment for their solution, but the contributive influence of unconscionable laws represents at least one factor in the situation that in large degree can be removed.

Relief in Sight

In connection with the possibility of early legislative action the most encouraging index of relief is the preparation on the part of the business community for intelligent co-operation with Congress in accomplishing the task. In addition to the activities undertaken by the established trade organizations, new bodies are springing up nation wide, each bent upon research and study with the purpose of bringing to Congress practical programs supported by arguments so prepared as to permit assimilation and action within the allotted time.

There is, however, a certain danger here that these numerous, and in many cases fundamentally different, proposals will prove destructive of the very ends they aim to achieve, unless some effort is made to merge the principal recommendations into one comprehensive program. This is not impracticable, although there may not be sufficient time to effect a proper co-ordination of detail. However, one general plan of procedure, substantially representative of business at large and comprehending the exigencies which surround the individual taxpayer, may possibly be accomplished if the minor divergencies are carried in the form of alternatives. After all, the codes drafted by these organizations can

William G. McAdoo

I think the graded excess profits taxes are bad, whereas a flat or fixed one seems to me wise.

I do not think well of a general sales tax; it is a consumption tax. A consumption tax hits the man with a large family very much harder than the man with a small family, and it is generally the poor who have the largest families. There are some consumption taxes we can afford to pay—on luxuries, for instance.

Nor do I think it is feasible to concentrate entirely on income taxes. The welfare of all people of the country must be considered, and you reach the point in taxing a man's earnings where you destroy initiative and constructive enterprise.

James M. Cox

The profiteer and some of the highly capitalized units have used the excess profits tax as a favorite excuse for loading onto the consumer, by means of highly inflated seling prices, many times the amount actually paid the Government. . . . . I believe that a better form of taxation than the so-called excess profits tax, may be found and I suggest a small tax, probably one to one and one-half per cent. on the total business of every going concern: It is to be understood that the term "business" as used does not include incomes received by wage-earners, salaried men, agriculturists and the small business man, who should be exempt from this tax.

Otto H. Kahn

The excess profits tax lays a heavy and clumsy hand on successful business activity. It is grossly inequitable in its effects, and, to a large extent, the greater or lesser degree of its burdensomeness is determined by purely fortuitous circumstances. It puts a fine on energy, enterprise and efficiency. It leaves untouched the man of wealth who neither works nor takes the risks and responsibilities of business, but merely collects his coupons. It is bound to operate unfairly, freakishly and unevenly, and greatly enhance the cost of things.

Woodrow Wilson

Simplification of the income and profits taxes has become an immediate necessity . . . . . There is a point at which in peace times high rates of income and profits taxes discourage energy, remove the incentive to new enterprise, encourage extravagant expenditures and produce industrial stagnation with consequent unemployment and other attendant evils.

Warren G. Harding

I doubt if the excess profits tax for war precisely accomplishes the end we seek in peace. . . . . Its operations have been disappointing, its costs multiplied and pyramided, and righteous changes and modifications ought to be sought at an early day. I would gladly recommend a change, but I am not yet prepared to suggest an equitable substitute, though I should have no hesitancy in asking Congress to seek the earliest possible solution.

be but recommendatory. Congress will have the decision, even though it cannot fail to give respect and consideration to such prominent and specialized talent as is now engaged with the most intricate subject in the history of Government.

Task is Difficult

It may be stated briefly and with easy confidence that the problem resolves itself into a revision of the income tax, elimination of the excess profits tax and substitution of as equitable and practicable a code as can be accomplished without sacrificing the primary purpose of providing the Government with essential revenue But here simplicity ends. Even those associated with the drafting of the laws of 1917 and 1918, fortified as they are with that experience, cannot view with other than apprehension the difficulties again presented.

It is to be remembered that the excess profits tax was finally adopted only after exhaustive consideration of every device and principle of taxation known and conceivable at the time; the present task requires the exercise of new ingenuity, as well as reconsideration of proposals then rejected as impracticable. Every effort will or should be made to enact by the next legislation a code that will stand funda-

Daniel C. Roper

It would be a long list, indeed, that would describe the uneconomic, unhealthy and repressive, and often unsavory business practices that are engendered by this condition. Experience has demonstrated the desirability of thoroughly revising the excess profits law as quickly as possible and of enacting new legislation which will produce needed revenue without such deterring effects upon industry and thrift, and without such delays in getting the money which is owing to the Government into the Treasury and which is overpaid back to the taxpayer.

H. N. Lawrie

That the excess profits tax has since the armistice operated to limit the investment of new capital in the expansion of the nation's industries is evidenced by the fact that during 1919 the physical volume of our industrial output was less than for any year since 1916. This serious limitation of the creation of new wealth upon which depends the nation's ability to liquidate its war obligations and enter upon a period of progressive reconstruction should be eliminated at the earliest possible date by the repeal of the law and the substitution therefor of a constructive and relatively simple system of tax income collection, which will be equitable in its application to the varied interests involved.

Jules S. Bache

I believe that the taxes of this country in their present form are in a great measure responsible for the high living costs, and the restiveness of labor.

Carter G. Glass

The excess profits tax encourages wasteful expenditure, puts a premium on over-capitalization and a penalty on brains, energy and enterprise, discourages new ventures and confirms old ventures in their monopolies. In many instances it acts as a consumption tax, is added to the cost of production upon which profits are figured in determining prices, and has been and will, so long as it is maintained upon the statute books, continue to be a material factor in the increased cost of living.

David F. Houston

It impresses me as indisputable and conclusive that the application or calculation of the excess profits tax is so complex that it has proved impossible to keep up-to-date the administrative work of audit and assessment. New returns are being made faster than old returns can be audited, resulting in an accumulation of claims and potential back taxes, the dangers of which have been described.

Public opinion has not yet awakened to the gravity of the consequences which are likely to follow a failure to simplify the tax law. . . . . I cannot contemplate delay without gravest apprehension. . . . . An imperfect and uncertain tax affects the future even more adversely than the present.

William B. Colver

Experience seems to have demonstrated that the excess profits tax is one of the foundation stones upon which the present intolerable price structure has been reared, and which works such hardship both upon the consuming public and so of course upon the business public.

mentally for at least several years. The public is fed up not only with retroactive imposts, but with constant and radical changes in methods and rates.

It is fortunate for the House Ways and Means Committee that it will have the benefit of the intensive study and substantiated recommendations of the organizations now engaged voluntarily in the difficult preliminary work. It is not an exaggerated belief that without the efforts of these bodies Congress would be prevented from effecting any appreciable relief at the next session, or prevented from enacting anything other than a hastily concocted substitute that probably within a year or two would necessitate further redrafting, with all the attendant evils suffered by the nation in the interim.

Divergent Proposals

A few concrete proposals, representing the best thought of intelligent business men and involving all the niceties of judgment displayed by economists and statisticians of repute, will prevent a repetition of the tedium and delays which attended the hearings by the House Committee in 1917 and 1918. But these proposals must comprehend at least a rela-

tive degree of accord in fundamental principles. It is the danger that there may not be sufficient time to bring about this singleness of object that today occupies the minds of many of the revisionists.

There is unmistakable evidence of a rapidly-widening breach between the revision advocates who have confined excess profits tax substitutes to a general sales or "turnover" tax at a low flat rate, and the proponents of a mixed code which either largely ignores a general sales tax or limits it to a list of selected commodities and depends mainly upon new and enlarged excise taxes with increase of both the individual and corporation income tax rates. It is, in fact, not unlikely that this divergence may ultimately be found in the House Committee, even perhaps in Congressional debate, as the principal taxation issue. Two broad principles are involved, the wider per capita distribution of the cost of Government and the extension of the existing large dependence upon the doctrine of ability to pay.

Objections to Sales Tax

It is not to be ignored that many of the revisionists who originally favored a general sales tax have recently reached the conclusion that it does not present a satisfactory substitute. The premises upon which they base their decision have been carefully considered, and while they are reluctantly and disappointingly received because of the rejection of what appeared to be the simplest and most prolific source of revenue, there is no gainsaying the comparative soundness of many of the objections.

Many forms of a flat-rate sales tax have been offered. The most important may be divided into three main groups:

1. Tax on every sale or turnover of commodities, services, real property, capital assets, etc., and on rent and interest.
2. Tax on commodities only, limited to goods, wares and merchandise.
3. Tax on commodities for final consumption or use.

The opponents of the general sales tax base their position upon the following brief summary of objections:

A general sales tax borders upon a tax upon gross income. If it is not shifted in its entirety it becomes a tax on gross income. Industry in many instances will be unable to shift the tax to the consumer, or in any event will be unable to pass it on until after several years of readjustment. A gross income tax is not less burdensome than a net income tax. If it is true that the sales tax in its burden upon industry would be insignificant compared with the excess profits tax, the tax if not shifted must be paid in large part by unsuccessful business enterprises, which do not pay a profits tax.

If concerns which are not making a profit are obliged to pay a sales tax, it is not reasonable to suppose that they can shift it any more than they have been able to shift other items of cost with a profit added. If any great proportion of the billion or more dollars that it is stated could be raised by a general sales tax could not be transferred the result would be disaster. Even though eventually such a tax might be passed on in its entirety there would be a transition period of several years, during which in many cases it could not be shifted or shifted only in small part.

To summarize, the assumption by sales tax advocates that the burden would almost invariably be borne by the ultimate consumer or user is, in the opinion of its opponents, not warranted by the fact that the extent to which the excess profits tax has been shifted is still in dispute, the nation is gradually passing from a seller's market to a buyer's market, there are in every industry certain marginal concerns unable to pass on immediately an added expense of any sort, and that many unforeseen complications inevitably result from any legislation vitally affecting economic conditions.

Further, inasmuch as in some industries the net profit does not average more than 2½ per cent. or 3 per cent. on the turnover, even a slight difference in the percentage of the tax on the turnover would cause a substantial difference in the percentage on net profits. In 1917 the total gross income of manufacturing corporations was $40,437,000,000, and the total taxable net income was but $5,736,000,000. The total gross income of trading corporations was $19,804,000,000, and the total taxable net income was $1,481,000,000. Assuming that the gross income did not greatly exceed the total sales, a tax of only 1 per cent. upon the gross would be equivalent to 7 per cent. on the net in the case of manufacturing corporations, and to 13.4 per cent. on the net in the case of trading corporations. These percentages are average. In some instances they would be lower, but in others considerably higher.

The indicated result of a sales tax of only 1 per cent would be the much discussed pyramiding to the extent of 2 per cent. or 3 per cent. on the final turnover, which in itself might not be objectionable, but equivalent in many instances to as high as 50 per cent. or 75 per cent. of the net profits. Another aspect is the inequity resulting from the fact that while one business may have a normal turnover of capital several times a year, another may fully utilize its capital but once in several years; a 1 per cent. sales tax in the former instance is conceivably liable to become more than the entire net income.

Advantages to Integrated Business

Analysis of concrete cases, it is held by the opponents of the sales tax, indicates fairly conclusively that the advantages which would be given by such a form of tax to enterprises

carrying on several consecutive processes in the manufacture or distribution of a commodity over other concerns not so self-contained, due to the pyramiding effect of a tax only on each actual sale, would be more than exceptional. The claim by proponents that the pyramiding effect of a turn-over tax would apply to only a limited number of enterprises is, it is now declared, not substantiated by investigation; further, that the premium thus placed upon synthesized business would not be small in comparison with the inherent advantages it already has, or at least there is no definite proof that such would be the case.

While it has been held by authorities in favorable comment that a universal flat-rate tax would in five years revolutionize present methods of doing business, the opponents of the sales tax submit the question whether business men should look with equanimity upon any device fundamentally changing practices that have proved their economic soundness by surviving the stress of competition.

Administrative Difficulties

Authorities who have long contended with the difficulties of excise taxes seem almost unanimously of the opinion that a general sales tax would involve serious problems of administration. The number of taxpayers would be so enormously increased that it would become a task of huge proportions to prevent wholesale evasions, with the practical certainty of a relative decrease in the percentage of present collections.

The difficulties experienced by the Bureau of Internal Revenue in organizing and maintaining a force sufficient to administer the present revenue laws are familiar. A vast number of returns remain unaudited and many of the tax cases arising under the 1917 Act are still unsettled. A genuine embarrassment is imminent if the new laws demand a reorganization and enlargement of the existing administrative machinery, such as would be required by a general sales tax. It is essential to the success of such a levy that it be properly and adequately administered from the beginning, but the difficulties in the way of organizing a sufficient and qualified personnel are so great as to constitute an important practical objection. The devising of forms of returns and methods of collection would be simple, but the multiplying of returns, audits and investigations is a matter of no mean concern. Even with the elimination of the smallest businesses by establishing exemptions, millions of returns would be required.

A tax only on commodities for final consumption or use, with the fixation of a single excise at one point, does not overcome the objections to a tax on each turnover. The rate would necessarily have to be 3 per cent. or higher, and the effect upon retailers, for instance, with many turnovers, and in some instances no opportunity to shift the tax, would be seriously inequitable, if not disastrous. The chief difficulty, however, is the impracticability of determining the ultimate consumer of ultimate user. A commodity purchased for immediate and final consumption in one case may be absorbed as raw material in process of fabrication in another. Innumerable examples might be cited.

Revenue Results Speculative

Estimates of the revenue to be provided by a general sales tax vary from $5,000,000,000 to $1,500,000,000, with a 1 per cent. tax on all turnovers, and down to $750,000,000 for a 1 per cent. tax on the sales of commodities alone. The wide diversity of the several estimates of yield is presented by the opponents as evidence of the impossibility of accurate forecast. No absolutely authoritative or dependable calculations are available apparently, and the dangers of speculative error perhaps cannot be avoided. An actual yield considerably less than estimated would prove seriously embarrassing; a result appreciably larger than expected might induce an extravagant tendency on the part of Government and add unnecessarily to the already excessive fiscal burdens.

Whatever the faults of the present system of Federal taxation, a factor of not inconsiderable importance has been the remarkably close identity of estimate and realization. A new code that does not afford an opportunity for even an approximate computation in advance of actual yield, of course, carries with it all the disadvantages of at least one year of experimentation.

Politics?

It is declared by many opponents of the general sales tax that it presents too many collateral exposures to political considerations. Even if that fact should not defeat its enactment, it is held that it would give rise to a constant possibility of becoming injected into partisan politics.

There is no ignoring the strong industrial and class opposition that has developed in certain quarters. There may be mentioned the growing and significant opposition to a general sales tax on the part of the agricultural interests. At the present time the publicity given to definite programs for revision of the tax laws has not been sufficient to cause any organized manifestation of opposition to any of the proposals, but it is known that the representatives of many agricultural organizations have been instructed to vigorously resist the sales tax. There are further complications possible as a result of the interest labor is certain to take in any tax revision by which it becomes more directly affected.

It is fortunate that Federal revenue legislation has heretofore been relatively free from partisan and territorial influence. Any device or combination of devices intended to provide five billion dollars annually by taxation with-

out unnecessary hardship must necessarily be of more or less complex structure, for the flat-rate income tax, even with its complications, embraces too many tested principles of equity to permit of elimination. The unbiased judgment of specialists is demanded even in the fundamental drafting of a revenue measure, as well as in its administration. It will be fortunate again if the forthcoming revision can be accomplished by an equitable distribution of the levy without engendering considerations of political expediency, and without submitting the process to any avoidable claims of discrimination.

The Excess Profits Tax

The various organizations engaged in preparation for the revision of the tax laws are virtually all in accord upon one point, that of complete abolition of the excess profits tax. Investigation has resulted in the determination of innumerable reasons for the repeal of Title III of the revenue act now in force. The more important are included in the following brief summary:

1. Diminishing productivity. Future results are too uncertain to permit dependence upon the excess profits tax as a definite means of producing a given amount of revenue.

2. Difficulty and impracticability of administration. The time consumed by the Treasury Department in arriving at a final determination of a majority of the excess profits tax returns is far too great. It creates an uncertainty in the business world, which is harmful and unnecessary.

3. Discrimination between the various forms of organization for the conduct of business.

4. Penalty upon the conservative corporations with corresponding premium upon capitalizations inflated prior to 1917.

5. Unjustly classes the profit of a corporation above 8 per cent. as excessive.

6. The definition of invested capital upon which exemptions and the graduation of rates are based is highly artificial and fundamentally unsound. It also is extremely complex and difficult. It ignores real value which has been created by conservative business management and excludes appreciation which may be largely due thereto.

7. Creation of a condition of pyramiding. While the excess profits tax has unquestionably had a broad effect in increasing costs in many instances, in others it has not; the prevalent uncertainty as to its actual incidence in this manner only tends to give rise to further complications. The actual influence upon living costs in unknown, but the effect to some degree is indisputable.

8. Encouragement of extravagance. The idea has been created that inasmuch as from 60 to 80 per cent. of an expenditure would in reality be borne by the Government, excessive expenditures were warranted. This feeling, which became so well established in 1918 has tended to persist even under lower rates.

9. Hostility on the part of the taxpayer, engendered by complexity of the task of preparing returns. The effect upon the administration of the law is certain.

10. Unnecessary costs of compliance. It is estimated that the business of the country is saddled with an expense of from $100,000,000 to $200,000,000 in endeavoring to prepare correct returns of income and excess profits, a large proportion of which is due to the profits tax.

A digest of comment upon the excess profits tax from prominent sources is appended. Particular attention is called to the opinions of the three Secretaries of the Treasury under whose administration the tax has been levied. The accord of view is significant.

Conclusions

It would be bold and venturesome at the present time to predict with any confidence even an approximate tax code that will replace or revise the existing system. Nevertheless an analysis of many authoritative determinations and recommendations presents the following conclusions:

Abolition of the excess profits tax is virtually certain. Some modification and improvement of the operation of the income tax will be effected; there is little likelihood of a reduction in either corporation or individual normal income tax rates, in fact they will probably be increased. A tax upon undistributed profits of corporations, without exemption in order that the unstable factor of invested capital may be eliminated, is more than a possibility. Excise and stamp tax rates will undoubtedly be raised and new commodities of wide distribution subjected to imposts. Tobacco and tobacco products, save cigars, will carry increased levies; sugar, coffee and tea may be found excisable to the extent of one cent or two cents per pound. Expansion of the tax on many luxuries or so-called non-essentials is probable, with a special tax on automobiles and trucks, and it is not impossible the first class postage rate may go to three cents.

If a general sales tax as now presented is ultimately eliminated, a modification carrying a selected list of commodities excluding prime essentials of life or providing a tax only upon costs in excess of reasonable limitations, may provide the basis for an acceptable compromise between a general sales tax and an excessive extension of the existing income tax rates. The excise tax law of Canada, enacted July 1 last, is offered for serious consideration.

Note.—This is the first of a series of articles dealing with Federal tax revision. The second will appear in the October issue of The Mining Congress Journal.

MINING AND PETROLEUM DIGEST

Zinc

The *Metal Bulletin* of London, England, summarizes the zinc situation in that country in the following paragraphs:

"The market does not show any particularly bright spots as yet, and it looks as if the probabilities were that prices would drag on at somewhere round about their present level for some little time. Business with the consuming trades continues very disappointing indeed, and although there has been less heard recently of reselling on the part of galvanizers, there is a continued disposition to ask for postponements of deliveries. As a consequence, there is little real support for the market, and as it is believed there is still a fair amount of spelter to come out for sale in September and October, mostly metal which has been carried forward, there seems no very good demand to absorb this, although should prices be seriously affected, no doubt the metal would be regarded as a cheap purchase. So far as supplies are concerned, there seems to be plenty of metal in the country, while Germany continues to offer at around the parity of the market here, and the same remark may be made of Norway.

"A rather unusual feature is that Germany has been offering some parcels of Japanese spelter of a well-known brand—possibly from the Hatachi Maru, captured and sunk by the Emden during the war. At all events, spelter of this brand was on board the boat named."

A recent issue of the *American Metal Market* summarizes the zinc situation as follows:

Zinc is almost low enough abroad to allow of shipment to this country, including duty.

The market here holds firm at unchanged prices. The demand is not heavy today, but a fair amount of consuming interest is evident. The strength of the situation lies rather in the anticipated shortage that the continued idleness of the plants closed by strikes may bring about.

It is reported from the Far West that producers are almost bare of stocks of ore on account of car shortage. There is an oversupply of ore at the mines, but little in smelters' bins.

The rise in price has today brought out a few lots of August and September zinc in middlemen's hands, but dealers in general do not seem to have much zinc bought ahead, and are more inclined to be buyers at present than to discount the future market.

Copper Stocks

The position of several of the stocks of the large metal producing companies is exhaustively discussed in the *Financial World*. This journal has the following to say of the copper stocks particularly, which have moved somewhat at cross-currents with the average price quotations on other issues:

"Ten out of the fourteen standard copper securities on the New York Stock Exchange (all of many years' standing) have the past week or recently reached the lowest price levels since we entered the war early in 1917.

"Nine of the ten stocks were selling the past week at such new modern lows, or within a point of the low record, and thirteen of the fourteen were selling the past week at the lowest prices reached in the series of successively new low marks which began to develop ever since last November, or 'low on the present move.'

"Of ten standard, seasoned coppers on the Boston Stock Exchange, representing all the leading copper 'groups' in the Hub market center, six of the ten have the past few days reached new record lows since we joined the war, and four of the six new lows are not only the lowest since we joined the war, but the lowest since eight years ago; since the summer of 1912, long before the war was thought of. All ten have in the past fortnight reached new lows on the present move since the summer of 1919, and the past week nine of the ten were within a point of such new lows.

"A coldly dispassionate glance at the figures is convincing on the point that the coppers are very low in price; that they are on the bargain shelf; that the current lows are lower, speaking generally, than the lows reached after the armistice, or the very drastic lows reached in the late 1917 market collapse. The present lows compare with the ridiculously low prices at the lowest ebb on the exchanges in 1914 after the outbreak of the war in Europe, and in several cases are even lower!"

Situation Analyzed

The Engineering and Mining Journal prints an exhaustive analysis of the copper situation, of which the important features are as follows:

"The copper market is still in the doldrums. With the exception of the first three or four months of the year, when buying of copper occurred on an unprecedented scale, the copper trade has sunk into a lethargic state from which relief is not yet in sight. The table pre-

sented herewith records the statistical position of the metal.

"Export trade, which has been largely counted upon to assist the copper market in its troubles, has exhibited encouraging aspects. The figures indicate that despite financial difficulties European nations and Japan were factors in the copper market whose importance should not be underestimated. The net balance of exports over imports of copper was maintained in the varying monthly amounts indicated, with the exception of June, when a small adverse balance was recorded.

"Domestic smelter production of blister copper has not varied much—always within a few per cent. of the preceding month—and is at the rate of 1,415,000,000 pounds yearly, about 17 per cent. more than the pre-war rate of 1,210,000,000 pounds. Refinery production is also above the pre-war rate. Owing to the large stocks of crude copper on hand at the refineries, transportation troubles did not affect refining as much as expected.

"The estimates of sales into foreign and domestic consumption total about 860,000,000 pounds for the first half of 1920. Domestic deliveries of copper for the same period are estimated at 680,000,000 pounds. Exports were 373,000,000 pounds, a large portion of domestic deliveries and exports the conclusion of heavy sales in the latter part of 1919. The estimate of domestic deliveries or consumption would indicate a consumption of copper of 1,360,000,000 lbs. annually, or on a scale much larger than the pre-war rate of 741,000,000 pounds—almost twice as much, in fact. This is one of the most optimistic indications in the copper industry, and were it not for one other factor which seemingly the copper industry is unable to eliminate, the market would be in a highly satisfactory condition. This factor, of course, is the large stock of both crude and refined copper still on hand. Domestic consumption is doing its share, but enlarged buying from foreign quarters, from France, England, Italy, and particularly Germany, is necessary before any great inroads into surplus stocks can be made.

"On January 1, 1919, according to the United States Geological Survey, there were on hand refined stocks amounting to 180,000,000 pounds and of blister copper 562,000,000 pounds. On January 1, 1920, there was 631,000,000 pounds of refined copper on hand and 310,000,000 pounds of blister copper, or a total of 940,000,000 pounds of copper. Let us say an average cost of 14 cents per pound had been expended upon this product, or a total outlay of $131,600,000, which is quite a bit of capital to have tied up in unmarketed copper in these days of stringent credit facilities.

"The price of copper has in general moved in sympathy with the situation in the metal. The lowest average price for electrolytic this year was recorded in June (18.07 cents), but in comparison with the conditions existing a year ago, with copper between 14 cents and 17 cents, the present averages are a pleasing comparison.

"The seriousness of the present condition demands emphasis. The United States, which is the world's leading copper producing country, is marketing a wasting asset at a cost but little above the cost of production. Every pound of copper sold diminishes by so much the nation's copper resources, which, although tremendous, are not of such a character as to warrant producing them and supplying the world at prices which represent an exceedingly small return. The obvious remedy that first comes to mind is to curtail production, thereby creating a smaller supply and easing the acute labor situation in other fields. In some cases such a step, by increasing the overhead expenses, might increase the cost of production. All producers have decreased their production drastically from war rates, and generally to the economic limit, refraining from a further decrease not only for business reasons, but for the certain measure of responsibility that they have toward the mining communities which depend for their existence upon the continued operation of the mines. Nevertheless, the situation is critical, and copper producers would be justified in forming plans whereby this valuable resource may be conserved to the best advantage and no one producer will take unfair advantage over his neighbor.

ANALYSIS OF THE COPPER SITUATION FOR FIRST HALF OF 1920—IN POUNDS.

Month	Crude Copper Production	Imports	Exports	Net Exports	Estimated Sales For. and Domestic	Estimated Stocks of Ref'd Copper on First of Mon.	Estimated Domestic Delivered	Av. Price
January	121,900,000	34,220,000	49,680,000	15,460,000	239,000,000	(a) 631,000,000		18.92
February ..	117,450,000	39,170,000	57,600,000	18,430,000	89,000,000	612,000,000	500,000,000	18.57
March.	120,310,000	28,870,000	88,030,000	59,160,000	320,000,000	585,000,000		18.33
April	116,080,000	21,950,000	64,390,000	42,440,000	100,000,000	520,000,000		18.66
May	114,960,000	44,860,000	83,280,000	38,420,000	62,000,000	469,000,000	90,000,000	18.48
June	116,670,000	31,510,000	30,100,000	(b) 1,410,000	52,000,000	456,000,000	90,000,000	18.07
Totals.....	707,370,000	200,580,000	373,080,000	172,500,000	862,000,000	485,000,000	680,000,000	
Yearly rate	1,414,740,000	401,160,000	746,160,000	345,000,000	1,724,000,000	July 1	1,380,000,000	

(a) 310,000,000 lbs. crude copper in addition.
(b) Net imports.

Silver

The stabilization of the silver market by purchases through the Treasury Department under the Pitman Act has so stabilized the market that for the first time since last May silver is quoted above $1 an ounce. The *Wall Street Journal* has the following article on the silver situation at present and of the possible future sales:

"For the first time since last May silver metal is quoted above $1 an ounce. Foreign silver was quoted at $1.01¾ on Friday, an advance of 3¼ cents. Quotation at London on Friday was 63¾d., up 2¾d. Only recently Director of the Mint Baker, in commenting on conditions in the precious-metal market, said that the decline in silver was due to a lull in buying from China and India, but that he believed it would prove only temporary. Demand for silver continues large from the arts and for use in photography.

"If the recovery in silver to above the dollar mark proves lasting, it will have an important bearing upon the market, as it will mean that producers in the United States will again sell their product in the general market and cease making sales to the Director of the Mint at the fixed price of $1 an ounce as established by the Pittman Silver Act. The Director of the Mint made his initial purchase of silver under the Pittman Act on June 17 last, when he bought 1,500,000 ounces. Since then purchases have been made almost daily, and the total purchased to date approximates 10,554,184 ounces. The Secretary of the Treasury announced last June that the department was ready to purchase 207,000,000 ounces under the Pittman Act, so that 197,000,000 ounces remain to be purchased."

Petroleum

In an extensive article in the *Petroleum Age* the possibilities in greater refinement and the preparation of motor gasolines from heavier hydrocarbons is exhaustively discussed. Some of the important factors in the problem and possibilities in their solution are as follows:

"There are several sources from which additional supplies of motor fuel may be expected. Benzol and toluol from by-product coke-oven plants may be blended with gasoline to give a very satisfactory product, while industrial alcohol represents a product to fall back on if necessary. Crude oil may also be derived from such kerogenous substances as oil shale, and there are enormous deposits of the raw starting material in various parts of the country, especially in Colorado, Wyoming and Utah, from which the crude oil may be extracted by low-temperature carbonization or a combination of this with ultimate high temperature effect in the presence of steam to recover the by-product ammonia.

"Petroleum consists essentially of a mixture of hydrocarbons which are in the main totally miscible with one another. Organic nitrogen and sulphur compounds also are present in varying amounts, and occasionally oxygen compounds, as well as water and inorganic material in disperse form. When this complex of naturally occurring hydrocarbons is treated by dry distillation at atmospheric pressure, the hydrocarbons of lowest boiling point are vaporized first and come into the condenser, followed by those of higher boiling point as the temperature rises.

"Varying degrees of fractionation will obtain, depending upon the design of still and method of operation. From the point where gases first appear at the condenser outlet until the temperature in the still reaches approximately 625° F., the products secured are in the main natural—that is, they exist in the crude oil as such. Above this temperature, however, especially if the distillation is carried out slowly, what is known as 'cracking' takes place, and a distillate is secured which upon redistillation will yield more gasoline and kerosene, their quality, however, in most cases not being comparable with that of the natural products.

"Instead of carrying out the distillation above the 625 point at atmospheric pressure in an ordinary still, one of special design is substituted, and the operation, if conducted at a pressure varying from 50 to 150 pounds gasoline, profound decomposition or 'cracking' occurs, and a yield of gasoline of 15 per cent. or more, based on the original charge of residue, maye be obtained upon 'rerunning,' or, in other words, fractionating the pressure distillate secured. The residue remaining and the pressure distillate which has thus been freed from gasoline may again be subjected to the process and a further yield of gasoline secured, this being less than in the first case, and decreasing upon subsequent treatments.

"This process of cracking is described as being a special application of the well-known phenomenon which occurs when organic compounds are heated to a high temperature, decomposition taking place and the molecules being broken down into compounds of lower molecular weight, even with the formation of the elements carbon and hydrogen.

"Again, if a sample of the same residual oil be placed in a vertical still having a fractionating column or 'tower' interposed between the still and the condenser, and the distillation is carried out at atmospheric pressure, with stirring, in the presence of anhydrous aluminum chloride, the latter acts as a catalyst to cause the decomposition of the oil into gasoline, giving a yield of 15 per cent. or more. This process is an illustration of the fact that chemical compounds, working at atmospheric pressure, may exert a result similar to pressure distillation.

"*Commercial Processes for the Production of Gasoline From Heavier Hydrocarbons.*—The various processes for producing motor fuel from heavier hydrocarbons may be roughly classified as follows:

"(1) *The Pressure Still.*—A 'two-phase'

cracking system. Examples are the Burton and Coast Processes.

"(2) *The Pipe Still.*—Generally a 'one-phase' cracking system. Examples are the Greenstreet, Hall, and Rittman processes.

"(3) *The Use of Catalytic Agents at Atmospheric Pressure.*—This may include reaction both in the 'single-phase' and the 'two-phase' systems. An example is the aluminum chloride process, which is likely 'two-phase' to some extent.

"(4) *Combinations and Modifications of Two or More of the Above Methods.*—The cracking may be in either 'single-phase' or 'two-phase' systems. Examples are the Dubbs, Jenkins and Bacon processes.

"(5) *Processes Involving Principles Not Included Under the Above Four Headings, but Which May Involve Similar Apparatus or the Use of Pressure.*—These methods may have either 'single-phase' or 'two-phase' cracking systems. Examples are the proposed processes of Cherry, Coast, Ellis, and many other processes equally unique. In the first a bipolar high voltage, oscillating, silent electric discharge is thrown across the vapors; in the second, hot gases are passed through the oil or into contact with oil spray, and in the third air is supplied to the cracking chamber, where, by combustion with a portion of the oil, heat necessary for the cracking of the remainder is generated.

"As early as 1865 James Young, the Scotch industrial chemist, secured a patent for the production of illuminating oil by means of pressure at about 20 pounds to the square inch.

"Burton's first patent was granted in 1913, and the process is used extensively at the present time by the various Standard companies. In 1918 it was estimated that 10 per cent. of the gasoline produced was by cracking, a large proportion of this being through Burton stills.

"The standard Burton apparatus includes a still of 200 barrels capacity or more, of conventional shape, so constructed that high pressures may be used. This process involves cracking mainly in the vapor phase. By the Greenstreet method a mixture of oil vapors and steam is passed through a coil of pipe, which is heated, the products next being permitted to expand in drums of considerable size.

"In the Rittman process the cracking takes place in an upright tube containing a rod and chain, the latter being thrown against the sides of the tube when the former is revolved. The oil is fed into the tube at the top, while the vapors are taken off separately from the tar pot at the bottom. All of these processes include the use of pressure.

The most conspicuous developments under this method have been carried out by McAfee of the Gulf Refining Co. The oil is heated and stirred in a still in the presence of an anhydrous aluminum chloride or other anhydrous salt of aluminum. Before treatment the oil must be freed from water and a quantity of the catalyst equal to a maximum of 8 per cent. by weight of the charge is added before the distillation is begun.

"Fractionating towers are interposed between the still and the condenser so that the higher boiling vapors may be returned to the still along with aluminum chloride which has been vaporized and carried out. The distillation is continued slowly at a temperature of 500° to 550° F. over a period of 24 to 48 hours. By this method a yield of gasoline of 15 per cent. or more may be obtained from residual oils.

"Very interesting in connection with this process is the effect upon the residue remaining in the still and the character of the distillate secured. At the end of the distillation it is found that the aluminium chloride is enclosed in granular coke, which is easily removed, and that a heavy oil free from asphalt, its viscosity in no way impaired by the procedure, may be separated from the coke and then utilized for the production of high-grade lubricating oils, the recovery of paraffin wax, or the manufacture of petroleum."

Oil Financing

The most important oil financing operation for the past year took place when the International Petroleum Co. of Canada took over the Tropical Oil Co. The details of this reorganization are summarized by the *Wall Street Journal* as follows:

"International Petroleum Co. of Canada, the leading Standard Oil organization in South America, has taken over the Tropical Oil Co., owning the de Mares concession of 2,000,000 acres of land in Colombia. Both the present International Petroleum Co. and the Tropical Oil Co. are to be merged into a new International Petroleum Co., according to an announcement made by G. H. Smith, president of the International Petroleum Co., Ltd., and J. C. Trees, president of the Tropical Oil Co. Negotiations have been in progress for several months past. Holders of more than 90 per cent. of the Tropical shares and of a large majority of the International Petroleum stock have consented to the arrangement. In the exchange of stock each share of present International Petroleum common will receive two shares of the new common, and each share of Tropical one and one-tenth shares of new International stock.

"The plan obviously is advantageous to both companies, according to the announcement, one being a producing, refining and marketing organization capable of handling a larger production, and the other a producing company without sufficient facilities for distribution. Their properties are in the same general latitude, and the new company will be one of the

most powerful, if not the largest, oil company doing business in Latin America. It will start off as a well-rounded organization owning ample production, large refineries, a fleet of oil-carrying tankers and distributing stations."

Another "Wonder Man"

The many oil companies engineered solely for the fleecing of the credulous base their certainty of success on the location of their property by some rod expert.

The extravagant and often humorous claims of witch-wizards who locate mineral deposits of various nature with instruments ranging all the way from a willow wand to a combination of springs, magnetic needles and barometric tubes, always furnish amusement to mining engineers. One of these wonder-workers has written a letter to the *Engineering and Mining Journal,* in which he modestly sets forth his qualifications as follows:

"I need waste no time studying the mineralogical or geological formations first, but I can very quickly determine whether there is anything there of value and be on my way.

"I claim and am ready to prove that I can locate and determine platinum and most all minerals of value from platinum down; also, coal, oil and gas. The only doubt that I have in regard to oil is the possibility of getting oil shale, but conditions would go far toward a determination. Gas gave me much experimenting, but I succeeded, and can prove it. I have a general coal locator and one each for anthracite and bituminous coal that have proved entirely satisfactory on coal of both kinds received and sold here by several coal dealers.

"I find most positive evidence of what I think must be a great deposit of coal that probably extends from the Central States across Massachusetts and on into the provinces. This coal changes from anthracite to bituminous near the Massachusetts coast.

"I have attractors for diamonds and other precious stones, and if you are yet skeptical and consider that I am an imposter, I will come to New York and demonstrate my system, and I hope you will have a few gems that you will put up against my ability. We will go to any metal-supply house, and I will locate the different metals and outline them from any floor above them. I also forgot to say that if you have any alcoholic liquor in your building to beware, as I might be tempted to get on the trail.

"I can locate fire and determine the extent of it. This, I think, may be useful in case of fires in mines. I also have an attractor for sugar, but have not yet made an effort to determine between sugar and molasses.

"I am now experimenting to determine both hard and soft deep-water streams. I am very sure now that I am right, but I will thoroughly prove that I am right or not by testing several hard and soft water veins that have been driven into near Boston.

"A human body I can locate anywhere, but it would be rather difficult to determine the body of a baby from any other animal body unless it was known that a baby was buried there, but I can get the shape or position of a body, and in that way I can tell the difference between a human body and an animal body.

"All deep-water streams run a few degrees east of north and a few degrees west of south. Do you know in which direction they flow?

"I find two substances in connection with coal and oil and three substances in connection with coal and gas. Who knows what they are?

"Also, I would like nothing better than to meet a few of the best mining engineers that the country can produce, and we will each be allowed one-half hour to find any faulted vein that you may know of, and if a reward can be offered, let the one who finds it within the time limit take it (of course, I mean the reward, and not the vein)."

Oil Shale

Mining and Metallurgy, the official publication of the American Institute of Mining and Metallurgical Engineers, contains a paper read before the Colorado Section by R. D. George on the subject of oil shale, which is of great interest.

"The most extensive shale-oil industry is that of Scotland. The Scottish shales are similar to ours, but differ somewhat in respect to their sulphur and nitrogen compounds. They are older, geologically, and have been subjected to greater pressure and heat, which have removed the more volatile hydrocarbons; they bear a relation to the Colorado shales similar to that of anthracite to bituminous coal; they may be said to be more mature. Being simpler, both chemically and physically, they are easier to treat. The shales of France, while of the same geological age as those of Scotland, have not been changed so much. The so-called shales of Bavaria and Bohemia are not true shales; they are partly formed lignites similar to those found in Dakota and Montana. The problems in treating them, therefore, are altogether different from ours. There is some true oil-shale in Bohemia, but it has never been exploited commercially. The Australian oil-shales are of still another type; they resemble the residues left from petroleum refining. They are somewhat similar to the torbanite which was the foundation of the Scottish oil-shale industry, but which is now worked out. The shales of New Zealand are similar to those of Australia. The Canadian oil-shales are unlike those of Colorado, but resemble the shales worked in some of the Eastern States for 'coal oil' before the oil fields of Pennsylvania began to produce.

"In considering the commercial utilization of

our shales not enough attention has been given to the refining. The retorting is much simpler, and in all probability several of the retorts already designed will give satisfactory results, but several important problems in connection with the refining of the product from the retorts, the crude shale oil, are unsolved. The ordinary methods used in refining well oil are not satisfactory. The old acid wash will destroy the gasoline and kerosene fractions and the unsaturated hydrocarbons will be rendered useless by the ordinary alkali wash. New methods must be evolved, and the users of fuel from shale oil will have to be educated to the use of a different type of fuel.

"There are certain objectionable compounds in the crude shale oil. Some of these are corrosive and some decrease the efficiency of the fuel; others are merely differences of appearance or odor from the corresponding well-oil products to which we are accustomed. For instance, the gasoline and kerosene made from shale oil are straw-colored instead of being water white. This does not affect the value of the fuel in the least, but might give the impression that there was some impurity present. These products, in the light of our present knowledge, cannot be bleached commercially. On the other hand, there is a certain substance present which forms a colloidal coating on the cylinders of the motors, and we must find a cheap method of removing this.

Shale gasoline in motors explodes more slowly than petroleum gasoline. For this reason it causes less vibration and is a more desirable fuel. In this respect it is similar to certain gasolines made by cracking the heavier petroleum oils. The Standard Oil Co. has been endeavoring to educate the public to the fact that such gasolines are superior to the old type. The shale gasoline is a better winter fuel because it is more easily volatilized at low temperatures.

Dr. Alderson On Shale

The result of the trip of Dr. Alderson to Scotland, which was reported in the last issue of the JOURNAL, should be most encouraging to the oil shale operators and prospectors of the West. Dr. Alderson returns most enthusiastic of the prospects of the future of that industry, says the *Mining and Scientific Press.*

The Scottish shale, he says, yields 20 barrels of oil per ton, this being half the yield from American shale. Even at that the Scottish shale affords a net profit of 50 cents per ton, despite the fact that the mining is done by hand and that wages are about $4.50 per day. The retort used in Scotland is not suited to our Western shale. Out of 14 types of retorts only one is at all adapted to the beneficiation of the shale deposits in Colorado, Utah and Wyoming. Dr. Alderson states further that crude oil can be won from shale at $1.85 per barrel in Colorado and Utah, where 5500 square miles of such rock is available for exploitation. A yield of even one barrel of oil per ton of shale represents a fabulous output. One 10-foot bed of shale, at one barrel per ton, represents over 15,000,000 barrels of oil per square mile of shale. The production of petroleum from wells in this country to date has been obtained from 4109 square miles, the estimated yield having been 2,280,000 barrels of oil per square mile. These are big figures. We hope that Dr. Alderson will succeed in stimulating intelligent interest in the subject. We note that the Comptroller of the Currency speaks of "the limitless oil shales of the West" in context with our resources in water-power.

Colorado Exploitation

The beginning of research in shale exploitation by the joint efforts of the Bureau of Mines and the State of Colorado have been undertaken. Of these beginnings the *Petroleum Age* has the following to say:

"Those of the oil shale operators in this country who are sincerely attempting to make a real industry of oil developments are anxious to obtain fundamental data on the retorting of oil shale, particularly as regards the effect of certain variable factors in the process of retorting on the quantity and quality of products yielded from oil shales when they are subjected to destructive distillation. From careful examination of a considerable number of suggested processes for treating oil shales and the conflicting ideas on which they are designed, it seems probable that accurate information of a fundamental nature is highly essential to the successful establishment of an oil shale industry in this country.

"Accordingly, the United States Bureau of Mines, in co-operation with the State of Colorado, is undertaking to furnish some definite and impartial information of this type through investigations now under way at the University of Colorado, Boulder, Col.

"A retort for the distillation of oil from oil shale has been designed and installed, together with the necessary auxiliary equipment for controlling and determining variable factors of distillation and for recovering and determining the quantity and quality of the products yielded from the shales. The retort is of such a nature that conditions of retorting can be accurately and completely controlled and varied at will. It is not designed as a commercial retort, but only for research purposes. A testing laboratory with equipment necessary for the examination of the shales, physically and chemically, and the products yielded by them, has also been fitted up.

"The material used in the investigation is oil shale obtained from the De Beque (Col.) shale field. It yields on distillation in the Bureau of Mines testing apparatus about 42 gallons of oil to the ton, and is therefore a fairly representative sample of the shales that probably will be first worked in Colorado. The shale

used will be as uniform as possible in character and oil yield, and will all be obtained from the same seam at the same point, in order to avoid the introduction of unnecessary variable factors in the tests and to render results strictly comparable.

"Effort will be made, as far as the equipment and capital at hand makes possible, to determine the effect of the following variable factors in retorting on the quality and quantity of the products produced from this shale.

"1. Rate of heating to a definite final temperature.

"2. Thickness of the shale layer in the retort.

"3. Size of individual particles of shale.

"4. Vacuum or reduced pressure.

"5. Various pressures above atmospheric.

"6. Steam atmosphere at various pressures and temperatures.

"7. Other atmospheres, such as carbon dioxide, carbon monoxide, hydrogen, illuminating gas, etc.

"8. Actual temperature reached.

"In each case the rate of formation of products and the total time necessary to bring the retorting process to completion will be determined.

"It is doubtful whether all these determinations can be made satisfactorily with the limited personnel and equipment available for the year, but it is hoped that sufficient valuable data may be obtained to be a real contribution to the present knowledge regarding oil shales and to justify a continuation and expansion of the work. As far as possible, the effect of each variable will be taken up by itself and thoroughly studied before passing on to another.

"Carefully conducted work along the lines above indicated should be of value in giving information on the following points:

"1. Are oils of different qualities formed from shales consecutively as their boiling points are reached, the so-called "fractional education theory," or does the shale yield a single, more or less uniform crude oil throughout the course of distillation?

"2. If the fractionation above mentioned takes place, to what extent does it progress, and hence to what extent may economies be introduced in refining shale oils, if the various fractions are directly recoverable for the retort?

"3. The time necessary at a given temperature to effect complete distillation of the shale and the quantity and quality of products so produced.

"4. The effect of steam and other atmospheres in retorting—

"(a) In forming undesirable emulsions with the oils;

"(b) In preventing the formation of undesirable hydrocarbons, such as olefins, diolefins and acetylenes in the oils;

"(c) On the recovery of the nitrogen of the shales, as ammonia or other nitrogen containing compounds;

"(d) On the combustion or utilization of the carbon remaining after the oil has been distilled, to provide combustible gas for retorting;

"(e) On quality and quantity of gas formed;

"(f) On heating efficiency of the retort;

"(g) On capacity of the retort, that is, time of completed distillation under most favorable conditions.

"5. What is the most favorable size of shale to retort?

"6. What quality and quantity of finished products may be expected from shale oil?

"7. How are the nitrogen and sulphur of the shale distributed in the products, and how may they best be removed or prevented from forming?

"8. Physical and chemical constants of the shale and products, particularly those of value in the design and operation of commercial plants, will also be determined. Work is under way on the determination of specific gravity, weight per unit volume when crushed to different sizes, heat of combustion, specific heat, heat of conductivity and chemical analysis of the shale, and specific and latent heats of the crude oil and its various distillation products.

"Summarized, the purpose of the investigation is to determine with scientific accuracy the conditions of retorting oil shale to produce the highest yield of the best products.

New Fuels

The adaptation of small units for reducing waste material into alcohol or other forms of fuel has been a matter of study in the Bureau of Chemistry for some time. Of the recent developments in this field the *Oil News* has the following to say:

"Gas for heat, light and power on every grain-belt farm, from the farm's own sources of supply, is an early possibility. Every farm that has waste straw, cornstalks or even weeds may become independent of the oil barons. The Bureau of Chemistry has produced a satisfactory gas or motor fuel from wheat straw at its experiment grounds at Arlington, Va., and is now working on other field refuse, such as straw from oats, rye and other grains, also dry weeds and cornstalks. A ton of wheat straw will make enough gas to equal in heat or power units 40 gallons of gasoline. It possesses combustible elements very similar to coal gas and has a blue flame. The development of a gas for the unit farm rather than commercial manufacture is the aim. The Department of Agriculture hopes to find a way for each farm to utilize the kind of straw and wastes that predominate in the place. The farmer will be able, if Uncle Sam succeeds, to convert his waste straw into gas and store it for future use. At least 20,000,000 tons of

straw are burned or wasted annually in the United States."

Another interesting development in the search for petroleum substitutes is suggested in this article in the *Oil News*. The use of by-products in the form of benzol is not new, but the breaking down of the hydrocarbons in coal into liquid fuel of a low grade is distinctly new.

"With the loss of the Saar coal Germany finds that in order to preserve even existing industries and to maintain or develop railway transportation facilities it will be necessary to make every possible effort toward developing its fuel supplies, utilizing, so far as possible, the national coals. In the opinion of some of her leading engineers this can best be accomplished by submitting the bulk of the coal to a special process of low-temperature distillation and then using the liquid fuel so obtained in Diesel engines to secure the bulk of the power required. This method would have the additional advantage of yielding by-products of great value.

The development of fuel oil from any available resource is of unusual interest at this time on account of the world's relatively slight increase in petroleum production with the resulting heavily increasing price of such fuel. And it becomes all the more a matter of importance because of the fact that there is an increasing demand for oil composition in factories, steamers, railways and automobiles.

Coal By-products

The coal industry is taking very seriously the possibilities of not only increasing the value of coal so treated, but also increasing its adaptability to use in large centers of population by devolatilization, thus producing a cleaner product both to handle and to consume, but also the added advantage of saving the by-products and making from them materials which may have even a greater value than the results from coal itself. These possibilities are exhaustively discussed in two articles in the *Coal Age*, parts of which follow:

In the burning of raw bituminous coal the volatile constituents are not even completely consumed, a considerable portion escaping as smoke. This is not only a waste of fuel but a nuisance, and many cities have already adopted smoke ordinances which prevent the use of bituminous coal, and these enactments have necessarily increased the demand for a smokeless fuel of the anthracite type.

The conversion of bituminous coal in commercial quantities into a fuel resembling anthracite is an attractive problem from many angles. The requirements of such a fuel are primarily that it be smokeless, easily burned, but not too expensive. It should be as uniform in size as possible, have a reasonably high heat value, be easy to handle and safe to store.

The name "carbocoal" has been given to the fuel secured. The method of its production is briefly as follows: Raw coal as it comes from the mine is crushed and fed continuously into low-temperature horizontal retorts by means of paddles. The volatile products of carbonization, i. e., the tar, gas and ammoniacal liquor, are treated essentially as in coke-oven practice. The semi-coke which is continuously discharged from each retort is quite different from ordinary coke. It is much softer, carries 8 to 10 per cent. of volatile matter and burns readily. It could be used directly in a power plant, either as fuel under the boilers or in gas producers, but is not in condition to market for general use.

In the next step of the process this semi-coke, or semi-carbocoal, is ground, mixed with pitch, fluxed and passed through a briquet press. The raw briquets are then carried to inclined retorts and distilled again at a temperature of about 1800 degrees F. for six hours. They are then dumped and quenched. The tar, gas and ammoniacal liquor from this high-temperature carbonization are collected and treated along with similar products from the low-temperature carbonization.

More Fuel and Tar Obtained

Yields of carbocoal and the various by-products obtained depend largely on the kind of coal used. Obviously, a coal of high volatile content will, in general, give a high yield of by-produts. If we take a coal of the following typical analysis: Moisture, 3 per cent.; volatile matter, 35 per cent.; fixed carbon, 55 per cent.; ash, 7 per cent.; the yields per ton of coal carbonized will be about as follows: Carbocoal, 1400 pounds; tar, 30 gallons; gas, 9000 cubic feet; ammonium sulphate, 20 pounds; light oil from gas, 2 gallons.

The yield of carbocoal is a little higher than the yield of ordinary coke from the same coal. This is because carbocoal has a slightly higher volatile content than coke, while about half the pitch used as a binder remains as coke in the finished briquet. The yield of tar is nearly four times that obtained in ordinary by-product coke-oven practice. This results chiefly from the low temperature employed in the primary carbonization.

For the same reason the composition of the tar differs considerably from that of the similar product obtained in an oven. It runs higher in its content of valuable tar acids, with more cresols and less phenol. Furthermore, it contains no naphthalene.

The ammonium sulphate yield is about the same as in by-product coke-oven practice. As the yield of solid fuel is slightly greater and the tar yield much larger than in coke-oven

practice, it follows that the amount of gas evolved must be less. There is, however, somewhat more than enough gas to heat both the low and the high-temperature retorts.

Ammonium sulphate finds a ready sale as a fertilizer, the present market price being about seven cents per pound. The light oil from the gas is combined with the light oil from the tar distillation. This fraction is then washed with sulphuric acid and worked up into motor spirit, the present price being a little higher than that of gasoline.

Distillation of the tar yields about 20 gallons of salable oils per ton of coal carbonized. These oils have a high market value. The tar-acid content is approximately 40 per cent., and for this reason the oils are highly desirable for making disinfectants, sheep dips, wood preservatives, flotation oils, etc. The manufacture of pure cresylic acid from such an oil is an easy step. This acid is now being imported into this country at a price of over a dollar a gallon. The pitch which results from the tar distillation is returned to the process, and is approximately the amount required for briquetting.

The carbocoal represents about 70 per cent. of the weight of the material treated. This fuel as it comes from the high-temperature retorts is in the form of hard briquets of a density much greater than that of ordinary coke and only slightly less than that of coal.

As a domestic fuel carbocoal compares favorably with anthracite. It has a heat value of about 13,000 B.t.u. (assuming a coal with 7 per cent. of ash, as above). Being of uniform size and quality, this product burns evenly in the fire bed, leaving under proper firing conditions a clean, light ash.

As a fuel on railway locomotives carbocoal has given entire satisfaction in the several tests so far made. The railroads are confronted with the problem of eliminating smoke at their city terminals, and it appears that the use of carbocoal will solve this problem for them. The fuel is well adapted to locomotive use, particularly in that it gives a steady, uniform fire and responds readily to draft changes. The absence of fines permits of maintaining a high combustion rate with less draft than is required for coal when it is necessary to force steam production.

Another pronounced advantage that carbocoal possesses over bituminous coal for railway use is that it can be stored in unlimited quantity with no danger of spontaneous combustion. This also is particularly important in the West, where hard coal is not available for storage and soft coal cannot be safely stocked in large quantities.

With the present shortage of petroleum oils and the prediction by the United States Bureau of Mines that the output of the present known, existing oil resources is limited to only two decades, the commercializing of low-temperature coal distillation is now most seasonable.

Low-temperature carbonization is by no means limited to high-volatile coals, but can be applied to almost any bituminous coal and even to lignite. With a coal of lower volatile content the yield of by-products will, of course, be less, but this in a degree is compensated by a higher yield of the carbocoal itself.

Bituminous coal has played a major role in the development of industry, and it is destined to play a yet more important part, not alone as a fuel but as a raw material from which a large number of commercial products may be manufactured. Most of the bituminous coal mined is still used directly as a fuel, but there are powerful factors operating to change this state of affairs. The increasing demand for fertilizers, for motor spirit, for the many products of coal tar, is one of these factors; conservation of our greatest natural resource is another.

All of these facts considered, it is not difficult to foresee a time when no raw bituminous coal will be burned for any purpose. But before that day arrives there must be available everywhere smokeless fuels to take the place of this coal, and in the very nature of the problem these fuels must be manufactured from bituminous coal or from coal of some lower grade. The production of carbocoal is a long step toward a solution of the problem, not only because of the high qualities of the fuel itself, but because the process of manufacture results in a high yield of by-products which serve to lower the cost of producing the fuel.

Water-power

The interest that United States Senator Wesley L. Jones has shown in the development of water power, particularly under the new Federal Water Power Act, induced the *Magazine of Wall Street* to call on him for an article in which Senator Jones makes the following pertinent suggestion and statement of possibilities of water-power development, particularly in the great West:

"The labor of one man is released for other purposes every time 50 hydro-electric horsepower is developed, and every 150 water horsepower developed releases one freight car for other duty.

Varied Uses of Water Power.

"The development of our water powers is intimately connected with the solution of such great national problems as the national defense, extension of inland waterways, supply of food, conservation of coal, oil and labor, irrigation of arid lands and relief from railroad car shortage.

"In addition to conserving vast quantities of coal and labor, the hydro-electric energy

existing in our running waters will, when developed, be utilized in the manufacture of explosives, fertilizers, wood pulp and paper, electro-chemicals, copper and aluminum and many other industrial applications. The utilization of even one-third of the enormous amount of energy latent but now wasting in our falling water would make the United States the greatest manufacturing country in the world. With the development of our water-power resources, billions of dollars of taxable property will be added to the wealth of the nation.

"In the rivers and streams of the United States we have an aggregate of 61,678,000 water horsepower.

"The act creates a Federal Power Commission composed of the Secretaries of War, of the Interior and of Agriculture, to which is delegated authority over all matters pertaining to the development of water powers in which the Federal Government has jurisdiction or in which it is interested as the owner of land or other property necessary to such undertakings.

"Preliminary permits allowing applicants three years in which to make examinations of water-power projects, to prepare plans and to make financial arrangements, may be issued by the commission. It may issue also licenses for a period of 50 years from the expiration of preliminary permits.

"The commission may reserve projects, the development of which in its opinion should be undertaken by the United State Government and report to Congress its opinions and suggestions regarding them. Preference must be given by the commission to States and municipalities where it deems different projects equally well adapted to utilize the water resources of the region concerned.

"The building of headwater storage reservoirs with a view of equalizing power production, preventing floods, and in arid States promoting the use of water for irrigation purposes on the lowlands after the water has been utilized for the generation of power, is given encouragement. The construction of locks in power dams in navigable streams with a view to extending navigation into the upper reaches of such water is provided for.

"By paying the licensee his net investment in hydro-electric plants the Government will have the option of purchasing such plants at the expiration of the 50-year license, or it may issue a new license to the original licensee, upon reasonable terms, or to a new licensee, who in that even shall pay the original owner his net investment in the plant. The law permits the United States to take over and operate during war time for manufacture of explosives, or for any purpose involving the safety of the country, any water-power plant under license. Authority is given the commission to make reasonable charges to cover the administration of the act and for the use of Government lands and property, as well as to take up excess profits which cannot be reached through regulation. The matter of rates to be charged consumers for power and also the regulation of service place licensees under supervision of State public-service commissions in these repects. The act provides severe penalties for non-compliance with its terms.

"Other countries, France, Spain, Sweden and Italy, are awake to the necessity of developing their water powers. With the enactment of this legislation we should enter upon a development the effect of commercial enterprises, the employment of our labor, new uses for our capital and increased wealth and prosperity for our people.

Alaska

On its editorial page the *Engineering and Mining Journal* discusses the use of airplanes for survey in Alaska. The opportunities for speeding up survey work by such methods would be invaluable says the Journal.

"On July 15 four army airplanes left Long Island for Alaska and return, a trip of 9000 miles. The trip has a double purpose, to establish an aerial route to Alaska and to make a photographic survey of certain typically unknown portions of Alaska.

"It has been reported that at least a preliminary photopraghic survey would be attempted of the Yukon Flats, an immense flat alluvial area at the great bend of the Yukon, where it desists from its course in the direction of the Arctic, turns an angle and heads for the Bering Sea. The great area is of fertile river-built soil and is wooded, and it is traversed by many river channels. Its survey, with the outlining of its waterways, would help to open it up for settlement and the raising of hardy crops, which grow with very great rapidity in the almost or quite incessant daylight of the Arctic summer. By the ordinary methods of ground surveying, a district like this will take a great length of time, much labor and expense, and much mathematics to check closed traverses. It is safe to say, that in the ordinary course of events, the work would be postponed for years. It is believed that an airplane can photograph it so as to make an accurate map in a few days, at a relatively small cost.

"Judging from developments, the reconnaissance plane survey by airplane photograph is destined within the next few years to become one of the most active departments of surveying.

"We may expect that the detailed map of the United States, which the Geological Survey has on hand, and which under ordinary conditions will be completed in some future generation, may become complete as to the reconnaissance plane survey within a few years."

Secretary Payne's Views

The *Engineering and Mining Journal* has the following interesting statement of the progressing attitude taken by Secretary Payne upon his return from his recent visit to Alaska. This detailed statement is of particular interest following the editorial which appeared in the last month's issue of the *Mining Congress Journal.*

Alaska's industrial progress is going to be stimulated if it lies within the power of the influence of the Secretary of the Interior.

Secretary Payne realizes that one of the most helpful things that could happen to Alaska would be a greater incentive to mine gold. While he understands that time must be the most important factor in restoring gold to its normal buying power, he believes that there is a great deal of gold in Alaska which can be mined under present conditions if capital and labor are made available and transportation improved, and other steps taken to reduce some of the unnecessary high costs now hampering all mining operations in Alaska.

The principal purpose of the visit of Secretary Payne and Secretary Daniels to Alaska at this time was to look into the matter of the production of coal from Alaskan mines. Secretary Payne authorized the construction of a washing plant at the Eska mine, which is on the line of the Alaska railroad. The product of this mine is now being used as railroad fuel, but the coal can be greatly improved by washing. It is intended to mine this coal in quantities sufficient to meet the commercial requirements of the territory tributary to the Alaska railroad.

The Chickaloon mine, which is at the terminus of the Matanuska branch of the railroad, produces a grade of coal equal to that of Pocahontas, Secretary Payne says. The vein is 16 feet wide. There are 400,000 tons of coal which have been blocked out. There is a 600-feet shaft and five levels on the property. The navy has $1,000,000 to spend in an effort to develop Alaskan coal.

Further in the interior the extensive lignite fields are expected to have a decided bearing on industrial development. There are promising anthracite veins in Alaska as well.

The Secretary thinks that other industries in Alaska are going to be stablized by the development of its agriculture. He was very much impressed with the high productivity of the soil and the large output per acre which can be had in a much shorter season than in the principal agricultural districts in the United States.

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1. Every person possesses the right to engage in any lawful business or occupation and to enter, individually or collectively, into any lawful contract of employment, either as employer or employe. These rights are subject to limitation only through a valid exercise of public authority.

In favor, 1675; opposed, 2.

2. The right of open shop operation, that is, the right of employer and employe to enter into and determine the conditions of employment relations with each other, is an essential part of the individual right of contract possessed by each of the parties.

In favor, 1665; opposed, 4.

3. All men possess the equal right to associate voluntarily for the accomplishment of lawful purposes by lawful means. The association of men, whether of employers, employes or others, for collective action or dealing, confers no authority over, and must not deny any right of, those who do not desire to act or deal with them.

In favor, 16,677; opposed, 4.

4. The public welfare, the protection of the individual and sound employment relations require that associations or combinations of employers or employées, or both, must equally be subject to the authority of the State and legally responsible to others for their conduct and that of their agents.

In favor, 1671; opposed, 4.

5. To develop, with due regard for the health, safety and well-being of the individual, the required output of industry is the common social obligation of all engaged therein. The restriction of productive effort or of output by either employer or employe for the purpose of creating an artificial scarcity of the product or of labor is an injury to society.

In favor, 1675; opposed, 3.

6. The wage of labor must come out of the product of industry and must be earned and measured by its contribution thereto. In order that the worker, in his own and the general interest, may develop his full productive capacity, and may thereby earn at least a wage sufficient to sustain him upon a proper standard of living, it is the duty of management to co-operate with him to secure continuous employment suited to his abilities, to furnish incentive and opportunity for improvement, to provide proper safeguards for his health and safety and to encourage him in all practicable and reasonable ways to increase the value of his productive effort.

In favor, 1679; opposed, 2.

7. The number of hours in the work day or week in which the maximum output, consistent with the health and well-being of the individual, can be maintained in a given industry should be ascertained by careful study and never should be exceeded except in case of emergency, and one day of rest in seven, or its equivalent, should be provided. The reduction in working hours below such economic limit, in order to secure greater leisure for the individual, should be made only with full understanding and acceptance of the fact that it involves a commensurate loss in the earning power of the workers, a limitation and a shortage of the output of the industry, and an increase in the cost of the product, with all the necessary effect of these things upon the interests of the community and the nation.

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Secretary Payne's Views

The *Engineering and Mining Journal* has the following interesting statement of the progressing attitude taken by Secretary Payne upon his return from his recent visit to Alaska. This detailed statement is of particular interest following the editorial which appeared in the last month's issue of the *Mining Congress Journal.*

Alaska's industrial progress is going to be stimulated if it lies within the power of the influence of the Secretary of the Interior.

Secretary Payne realizes that one of the most helpful things that could happen to Alaska would be a greater incentive to mine gold. While he understands that time must be the most important factor in restoring gold to its normal buying power, he believes that there is a great deal of gold in Alaska which can be mined under present conditions if capital and labor are made available and transportation improved, and other steps taken to reduce some of the unnecessary high costs now hampering all mining operations in Alaska.

The principal purpose of the visit of Secretary Payne and Secretary Daniels to Alaska at this time was to look into the matter of the production of coal from Alaskan mines. Secretary Payne authorized the construction of a washing plant at the Eska mine, which is on the line of the Alaska railroad. The product of this mine is now being used as railroad fuel, but the coal can be greatly improved by washing. It is intended to mine this coal in quantities sufficient to meet the commercial requirements of the territory tributary to the Alaska railroad.

The Chickaloon mine, which is at the terminus of the Matanuska branch of the railroad, produces a grade of coal equal to that of Pocahontas, Secretary Payne says. The vein is 16 feet wide. There are 400,000 tons of coal which have been blocked out. There is a 600-feet shaft and five levels on the property. The navy has $1,000,000 to spend in an effort to develop Alaskan coal.

Further in the interior the extensive lignite fields are expected to have a decided bearing on industrial development. There are promising anthracite veins in Alaska as well.

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In favor, 1677; opposed, 3.

8. Adequate means satisfactory both to the employer and his employes, and voluntarily agreed to by them, should be provided for the discussion and adjustment of employment relations and the just and prompt settlement of

all disputes that arise in the course of industrial operation.

In favor, 1668; opposed, 8.

9. When, in the establishment or adjustment of employment relations, the employer and his employes do not deal individually, but by mutual consent such dealing is conducted by either party through representatives, it is proper for the other party to ask that these representatives shall not be chosen or controlled by, or in such dealing in any degree represent, any outside group or interest in the questions at issue.

In favor, 1568; opposed, 54.

10. The greatest measure of reward and well-being for both employer and employes and the full social value of their service must be sought in the successful conduct and full development of the particular industrial establishment in which they are associated. Intelligent and practical co-operation based upon a mutual recognition of this community of interest constitutes the true basis of sound industrial relations.

In favor, 1664; opposed, 2.

11. The State is sovereign and cannot tolerate a divided allegiance on the part of its servants. While the right of government employes, national, State or municipal, to be heard and to secure consideration and just treatment must be amply safeguarded, the community welfare demands that no combination to prevent or impair the operation of government or of any government function shall be permitted.

In favor, 1663; opposed, 4.

12. In public-service activities the public interest and well-being must be the paramount and controlling consideration. The power of regulation and protection exercised by the State over the corporation should properly extend to the employes in so far as may be necessary to assure the adequate, continuous and unimpaired operation of public-utility service.

In favor, 1649; opposed, 18.

The referendum on public-utilities employment carried the recommendations of the Chamber's committee on public utilities. These are two in number, and are given as follows, with the vote on each:

The committee recommends that strikes by employes of all public-service corporations performing public service essential to the lives, health, security, comfort and well-being of the people should by law be explicitly prohibited.

For, 1564; against, 97.

The committee recommends that suitable tribunals should be created by law to adjudicate differences between the employes of public-service corporations and their employers, and that the decisions of such tribunals should be final and binding upon both parties.

For, 1571; against, 100.

Nobody Seems to Care

The cries of food speculators, particularly in sugar, for help during the recent decline from their artificially produced high prices have aroused little sympathy. Of this the *Wall Street Journal* says:

"War profits have destroyed the commonest idea of sportmanship. These merchants consider that they should be publicly guaranteed in a certainty. They have made extortionate profits, and now demand, the first time the market turns against them, that someone else should bear the loss. Like other speculators, they have doubtless been pyramiding, and if some of them swell the increasing list of commercial failures the rest of us will be able to bear the shock with Christian fortitude."

COST DATA PUBLIC NECESSITY SAYS TRADE COMMISSION

In its reply to the injunction sought by the Maynard Coal Co. of Columbus, O., restraining the Federal Trade Commission from requiring monthly report, the Commission says that conditions in the coal industry respecting costs of production and prices necessitate collection of information on the industry. The Commission says:

"The abnormal situation of the coal industry now, both as respects the costs of production and prices, and the frequent disputes as to the reasonableness of prices necessitates the collection of information by the Commission which will show the true situation of the industry, as such information is not now available from any other source. This information would be of great value, especially at the present time, to mine operators, mine workers and the general public, and absolutely essential for the information of any intelligent Government policy with regard to the urgent problems of this industry."

The Commission denies the contentions of the Maynard company that forms for the collection of its information would necessitate changes in accounts; that it was exceeding its authority, and that power to require such reports had been transferred by the President to the Fuel Administration.

Anti-Trust Law Pamphlet

The Department of Justice has issued in pamphlet form a compilation of Federal Anti-Trust Laws, with amendments and a list of cases instituted by the United States and decisions rendered thereunder by the courts up to January 31, 1920. It is a pamphlet of 130 pages, and is of interest to manufacturers, business men and students of anti-trust proceedings. Copies of the same may be had upon application to the office of the Attorney-General, Washington, D. C.

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Extensive Asbestos Deposit Reported

An asbestos claim has recently been located in Apache county, Arizona. The deposit is said to be extensive, having been traced over 20 miles. Vein exposures are so prominent that, according to report, one can, without the aid of miners' tools, pick up a ton or more of crude asbestos that has broken down from the exposures.—Bureau of Mines.

Silver's Future Bright

It was thought that the Pittman Act in this country, providing for the repurchase of silver to replace that melted and exported to India during the war, would sustain the silver market above $1 an ounce for some time to come, but now the currency arrangement of India seems to insure an even higher minimum, and a bright future for the silver mining industry.—Bureau of Mines.

Coal Mine Fatalities Decrease

According to official reports from all State mine inspectors, except Kentucky, 148 men were killed in American coal mines during May, 1920, as compared with 170 in the same States last year. The decrease is 13 per cent. Based upon an output of 46,686,273 tons in May, 1920, the fatality rate is 3.17 per million tons produced.

During the first five months of 1920 803 lives were lost, a decrease of 47 from the record of the parallel months of last year. The production of coal during these five months was 247,737,273 tons, an increase of 39,432,273 tons over the first five months of last year. While production increased nearly 19 per cent., fatalities decreased 5.5 per cent.

Coal Exports for Five Months

During the first five months of 1920 the United States exported 11,618,806 short tons of coal, valued at $68,301,514. Of this tonnage 9,108,091 tons were bituminous and 1,817,715 anthracite.

Havre-to-Paris Pipe Line

By the provisions of a decree published in the *Journal Officiel* of July 28, 1920, a French company has been granted permission to establish a pipe line between Havre and Paris for the purpose of conveying petroleum from the former port to Paris and intermediary points. The pipe line is considered necessary because of transportation difficulties.

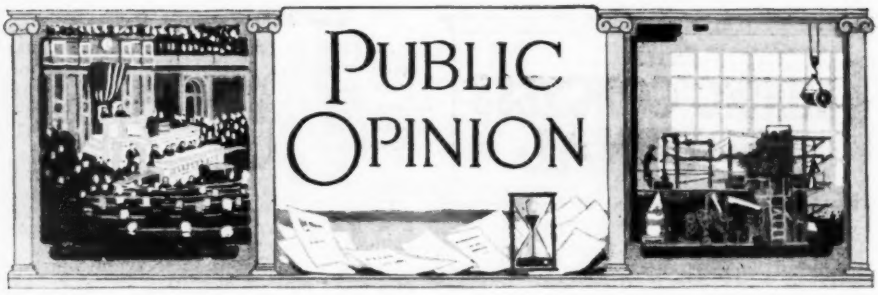
American Miner Leads World

The American coal miner leads the world. The largest average production ever made by underground workers in one year was 1134 short tons, which was the average American production during 1918. New South Wales, with an average of 814 tons, was America's closest competitor. British Columbia came third, with 790 tons and Nova Scotia fourth, with 718 tons.

Not only the annual, but also the daily output of coal of the underground worker is greater in the United States than in any other country, and the former holds true notwithstanding the fact that the working year is usually shorter in America. For the 18-year period beginning with 1901, American mines were operated from 195 to 258 days. Records of the Bureau of Mines show that each underground worker in 1901 averaged 3.37 tons a day, and increased his daily output to 4.40 tons in 1918.

Treasury Drops Heavy Load

The Treasury on September 1, was relieved of the guarantee payment to the railroads, which during six months amounted to $567,000,000. The income of the Treasury will be augmented by $55,000,000, the increased amount of taxes which will be paid on increased rates.



Remedies for industrial unrest still occupy the attention of those who are endeavoring to solve the labor situation. **Thomas A. Edison,** basing his conclusions upon recent investigations made by him, says:

> "I believe that if you can make the industrial worker understand what capital and management are doing for him it will go a long way to cure this so-called 'unrest.' The average factory hand today has no conception of what capital is being invested for him in better machinery and tools to make a better job for him.
>
> "I've seen figures somewhere showing that invested capital has increased enormously year by year for each worker, while the value of manufactured goods has increased per worker in a much smaller proportion.
>
> "England is our nearest competitor in the amount of horse-power used for each worker and in the principal industries, and we are three times better off than England—that shows in our higher production per worker and his better way.
>
> "And office workers are going to have better jobs as they get more automatic machinery to help them."

The *Wall Street Journal* recently published one of its interesting "editorial-sermons" upon the commandment that "six days shalt thou labor, and the seventh day rest," stressing the point of "six days shalt thou labor." With this idea in mind, **W. A. Sadd,** president of the Chattanooga Savings Bank and vice-president of the Savings Bank Section of the American Bankers' Association, in a meeting before the Georgia Bankers' Association, said:

> "We read that France has gone to work, that England has gone to work, that Germany is working on a ten-hour basis, and finally that Soviet Russia is enforcing a conscription of labor for a longer working day than American industrialism would favor. When will America go to work? The tax situation has received a lot of unfortunate discussion. Economists can demonstrate to the satisfaction of any open-minded individual that staggering as is our national budget the cost thereof to the ultimate consumer is several times the amount actually received by the Government. While not seeking in the least to minimize the relation of currency and credit inflation to the high cost of living, I would express the firm conviction that the absolute unnecessary waste and extravagance which makes our national budget unnecessarily high, combined with the demonstrated faults in the national system of taxation, methods of financing which savor too strongly of political camouflage, have a bearing upon the high cost of living which the average man is too apt to overlook; that also, as labor represents between 80 and 90 per cent. in the cost of production, we have only to look about us to discover the great possibility for increased production per man and per hour of effort."

William H. Barr, president of the National Founders' Association, of Chicago, said a significant thing to the members of that association in a letter of August 19. He speaks with authority for employers of labor, but what he says is in no sense an ultimatum to the worker. It is an unpretentious declaration of facts, which for the worker's own sake must be faced.

> "There is no desire on the part of employers to reduce wages unnecessarily, but they must be adjusted, according to the laws of supply and demand, in accordance with prices. There is one way in which wages may be kept up, although not neecssarily to the present figure. The employer must adopt the policy of selec-

tion. He must weed out the slacker and be prepared to give to the honest, loyal worker suitable reward in the way of highest possible wages, good working conditions and, as far as may be established, the element of permanency in employment. Wages can be kept up only if the worker gives as near to 100 per cent. efficiency as possible. But if this efficiency is to be diluted by the introduction or continuance in employment of the slacker, wages will decrease and idleness threaten."

The passage of the water-power bill has led to much speculation as to the conservation of those things which can be supplanted by water-power. **A. H. Armstrong** of the General Electric Co. says:

"That of the 176,000,000 tons of coal used in a recent year by American railroads more than 122,500,000 tons could have been saved by electrification, and that the drawing from water-power would have constituted a greater saving. The trouble with the railroads is that they are suffering from physical stagnation produced by the fact that steam-engine development has not kept pace with the needs of modern transportation. He urges the immediate electrification of the more difficult divisions where the limitations of steam engines are most keenly felt, and says that the most powerful steam engines are pygmies compared to the largest electric locomotives in operation. It has been found that a ton of coal burned in a locomotive boiler will haul a ton of passengers, freight or cars 6900 miles. On an electrified road the same amount of coal will move an equal load nearly three times as far."

Ira C. Tichenor, writing to the Salt Lake City *Telegram,* has the following to say in approval of the position taken by the American Mining Campaign in the present gold emergency:

"Doubtless it will be regretted by the gold producers of the country and also by economists who consider the future of America, as relating to its position in the world's financial and industrial circles, that Secretary of the Treasury Houston has taken a stand in opposition to the plan approved by The American Mining Congress to maintain normal gold production by imposing an excise tax on all gold used other than monetary purposes and the payment of a premium to producers of newly-mined gold.

"The principal objection raised by the Secretary of the Treasury to such a plan is that the payment of a premium on new gold production would be a subsidy. Secretary Houston evidently does not realize that under the prevailing conditions of high costs of labor and material gold producing is costing the miners more than the net price of $20.67 an ounce, and that by selling the metal to manufacturers at that price the Government really is giving the manufacturers a subsidy, but at the expense of the producers."

The importance to the mining industry of a national organization representing it at Washington is pointed out by the Denver **Record,** which says:

"The West can make itself heard in Congress if it will stand as a unit behind The American Mining Congress, which is evidently its only hope in Washington. Mining men will meet in Denver this fall to work out plans to better the industry. Every mining man who possibly can attend the Mining Congress session in Denver should do so."

That the mining industry will feel the effects of freight-rate increases, and feel them deeply, is the opinion of the *Daily Mining and Financial Record,* Denver, Col. This publication expresses its sentiments as follows:

The metal mining industry will suffer from the advance of freight rates, and overhead costs will be increased, not only in the additional charge for moving ore to mill or smelter, but higher prices will be asked on mining supplies, to meet the enhanced freight charges on such material to the mining camps. The gold-mining industry is already overburdened, while gold stands still at $20.67 an ounce. Silver mines are somewhat better situated. The white metal commands $1 an ounce, through the Pittman Act, and New York advices tell of a higher price paid, and world demand may bring about still further advance for silver. But at present the margin of profit will be reduced fully 20 per cent.

Lead, zinc, copper, silver, gold mines will all be affected and production costs will mount upwards, enforcing many of the smaller operators to curtail both development and production.

The coal miner alone is not affected, for coal will assuredly advance to offset the increase, while the metal miner, whose product has depreciated, must pay the higher price for fuel or close down.

Practically two-thirds of the freight on Western roads is reported dependent upon

the mining industry, but if mines are forced to cease operating through this added operating expense, railroad earnings must decrease accordingly, and other industries, together with the long-suffering American public, will be called upon to meet the deficiency and dig deeper to "pay the freight."

"There is a long period of prosperity ahead for the conservative silver mining venture, according to the *Mohave County Miner and Our Mineral Wealth*, Kingman, Ariz. This publication points out that up to September 1 the United States Mint had purchased only 13,000,000 and some odd thousand ounces of the authorized 200,000,000 ounces. The New York *Times*, viewing the silver outlook, says:

> There is a long period of prosperity ahead for the conservative silver mining venture. Uncle Sam has purchased only 10,000,000 ounces of his order for 200,000,000 ounces. Even the New York *Times* is alive to the bright outlook for silver. That newspaper says: "From this it is evident that, with the United States production out of the market and the Mexican output below normal, the world's needs will again make for higher prices. It will appear that the shortage of silver would warrant the belief that silver's permanent level will be well above $1 an ounce."

ALASKA COPPER AND GOLD PROBELMS GIVEN ATTENTION

O. C. Ralston of the Bureau of Mines left August 10 for Alaska to co-operate with A. H. Brooks of the Geological Survey in studying metallurgical problems with the idea of stimulating the mining industry in Alaska, and particularly to investigate the feasibility of smelting Alaska copper ores within the territory.

This investigation was embodied as one of the principal recommendations in the report to Secretary of the Interior Payne of the Alaska Advisory Committee, composed of representatives of the Interior, Postoffice and Agricultural Departments. Secretary Payne on June 14 sent a memorandum to Dr. F. G. Cottrell, Director of the Bureau of Mines, directing that this recommendation with others be put into effect, and the dispatching of Mr. Ralston to Alaska was the result.

Alaskan copper mines were first operated in 1910, and since that time they have produced a total of 545,000,000 pounds of the metal, valued at $114,526,000. Their maximum output was achieved in 1916, when, stimulated by war demands and prices, production amounted to 119,885,000 pounds, valued at $29,484,000. Owing to decline in price and to uncertainty in the market production fell in 1919 to 47,220,000 pounds, valued at $8,783,000.

Bad Roads Retard Progress

One of the principal drawbacks to the development of Alaska is the lack of transportation facilities. Copper deposits are widely distributed in the territory, and the Advisory Committee in reporting expressed its belief that their exploitation would increase when transportation conditions were bettered. A considerable part of the present copper output has come from the high grade ores of the Chitina district. Large bodies of low grade ore have been found in several districts, notably on Prince William Sound, and the exploitation of these, in the opinion of the Advisory Committee, should give a greater stability to the Alaska copper mining industry.

Secretary Payne in his memorandum of June 14 also directed that the Bureau of Mines make an investigation and report on methods and costs of placer mining in Alaska, this investigation to be specially directed toward development of methods for exploiting the large bodies of auriferous gravels of low gold content. More than 60 per cent of Alaska's population has in the past been employed directly or indirectly by the gold mining industry. Activity in the industry was curtailed because of economic conditions imposed by the war, and as a consequence the value of Alaska gold has steadily declined from $17,242,000 in 1916 to about $9,550,000 in 1919. The decline in gold mining, the Advisory Committee points out, has been the principal cause of Alaska's loss of population and the discouragement of her residents. The committee cites the fact that in 1916 4000 men were engaged in placer mining, whereas in 1919 this number had dwindled to 2000.

Field Awaiting Development

Excerpts from the Advisory Committee's report, which are especially pertinent in view of the beginning of these investigations ordered by Secretary Payne, show the following:

"Alaska gold lode mining in the past has been chiefly based on large low-grade deposits of the Juneau district, whose profitable exploitation has been possible only by very large operations. The enormously increased cost of mining, owing to the present economic conditions, has greatly curtailed mining at Juneau.

"The most promising field for Alaska gold lode mining is in the exploitation on a small scale of the auriferous lodes of higher gold tenor, which have not been found in many localities, notably in the Willow Creek and Fairbanks districts. Geologic information indicates a wide distribution of auriferous deposits, and there is every reason to believe that other workable deposits of gold-bearing quartz will be developed when the country is opened up by railroads and wagon roads."

MID-YEAR METAL MINING SURVEY

A survey of mid-year metal conditions in the Western States leads to the conclusion that 1920 production will exceed the 1919 output only in very rare instances. The low price of gold, unsettled market conditions affecting copper, lead and zinc, increased operating costs and labor scarcity all combined to keep down production during the first six months of the year. The passage of the Pittman Act was the greatest stimulus of the year to the production of silver.

The following survey by States combines the findings of various experts:

Arizona

Arizona mining conditions improved in the early part of 1920, although there was no great change in volume of production, according to preliminary advices received by the Department of the Interior. The gold output of 1919 was only $4,231,000, much less than in 1918. Still another decrease is anticipated for 1920. The State's output has been increasing on account of the gold content of copper ores and the discovery of gold at Oatman, but many of its gold mines are idle. Arizona silver is derived mainly from copper and lead ores. The 1919 output was approximately 4,927,500 ounces, valued at $5,479,000. High prices prevailed during the first four months of 1920, but total annual production greater than that of 1919 is not expected unless the smelting of silver-bearing copper ores is increased. Shipments of bullion from smelting plants indicated a copper production for 1920 greater than the 522,020,000 pounds produced in 1919. Large producers during the early part of the year shipped around 45,000,000 pounds a month, but the shipments included copper left over from 1919.

California

According to C. G. Yale of the United States Geological Survey, "conditions in the metal-mining industries in California during the first half of 1920 were even more burdensome to the operators than in 1919. The high cost of supplies and labor and the scarcity of skilled labor have increased the number of mines that have suspended or curtailed operations and have materially lessened the output of metals."

During the first six months of the current year California mines sent $7,811,390 in gold, or $1,086,739 less than during the parallel period of 1919, to the United States Mint and local smelters and refineries. If monthly receipts continue at the same rate, the year's output will be $1,757,000 less than that of 1919. Operations have been stopped on a large number of mines, while others which were operated profitably under normal conditions are worked at a loss to prevent a still greater expense of closing down altogether. Shortage of skilled miners, fires and shortage of water are contributing to the decrease in production.

Colorado

"The year 1920 started with mining men all hesitant as to future action," according to Charles W. Henderson, in a statement on the Colorado situation prepared for the United States Geological Survey. "Silver sold at high prices, but was unsteady, and many hoped that Congress would take some action in regard to an excise tax on gold sold for use in manufactures, but no such action was taken. During the recent rapid drop in the price of silver, before arrangements were made to apply the Pittman Act, guaranteeing $1 an ounce for silver, many small lessees abandoned work or postponed prospective developments."

For several years Colorado operators and lessees have been influenced strongly by the fluctuating price of silver and the fixed price of gold. During the war Cripple Creek operators found prices for labor and material burdensome. Economies were soon overbalanced by increases in cost, and at the beginning of 1920 only the financially strong properties were in operation. Cripple Creek produced $5,800,000 in gold in 1919, but Mr. Henderson predicts a falling off to $4,000,000 in 1920.

Idaho

Idaho will turn out an increased production of silver, lead and zinc in 1920 if the present rate is maintained. Shipments during the first five months of the year were not so large as those in normal times, but were considerably greater than those of 1919, which were less than the annual average of the last ten years.

The 1919 gold production was $703,000 as compared with a 10-year average of $1,085,350. The 1919 silver production was the lowest for three years, amounting to 5,700,000 ounces, valued at $6,340,000 as compared with a 10-year average of 9,730,180 ounces. Producers of silver-lead ore are making larger shipments than in 1919.

Last year's copper output amounted to 3,140,000 pounds, valued at $591,000, a considerable decrease over 1918, and the current year may see still another falling off. After producing 294,695,993 pounds of lead in 1918, the Idaho mines turned out only about 184,070,000 pounds in 1919, when many of the large mines were idle. Conditions improved somewhat during the first six months of the current year. The zinc output decreased from 45,161,712 pounds in 1918 to approximately 16,565,000 pounds in 1919. If shipments of ore and concentrate continue at the rate of the first six months, the 1920 output will be larger.

Montana

Although operating costs continued high and labor conditions remained unsettled, early 1920 months saw the output of Montana mines approaching normal, according to C. N. Gerry of the United States Geological Survey, before strikes and other troubles operated as a

damper against optimism. In Mr. Gerry's opinion, in 1919 the gold output of $2,272,000, itself smaller than the 1918 production, was greater than the 1920 production will be. The recovery of gold by dredges is decreasing rapidly, and operators, especially those working low-grade deposits, have been hampered by high costs.

The State's larger copper mines with silver-bearing ores were producing about 60 per cent. of normal output in mid-year, indicating decreased production of silver for the 12-month period, as compared with the 1919 output of 13,280,000 ounces, valued at $14,768,000. The copper output in 1919 was 180,246,000 pounds, valued at $33,940,000, against a normal annual production of about 300,000,000 pounds. Shipments of ore and bullion for the first five months of 1920 presage an average production of 17,500,000 pounds a month, as compared with 15,000,000 pounds a month in 1919. Montana produced about 42,000,000 pounds of lead in 1919, an increase over 1918. The State's output has increased steadily during the last few years on account of the saving of lead after the lead-zinc ores had been leached. Another increase in total production was, in mid-year, considered not improbable. The Montana zinc output in 1919 was about 176,000,000 pounds, valued at $12,914,860. If the output of the first six months is maintained, the total production of 1920 will show a great increase.

Nevada

There was active development of Nevada mines in the first part of 1920, but no general increase in shipments of ore concentrates or bullion, according to V. C. Heikes of the United States Geological Survey. Mines throughout the State produced at a rate below normal on account of operating expense and labor scarcity. The State's gold output decreased from $6,619,937 in 1918 to about $4,718,000 in 1919, and a further decrease is indicated for 1920. Silver production fell in 1919 to 7,000,000 ounces, and on account of labor troubles Mr. Heikes was unable to predict an immediate increase. Copper production fell from 116,316,441 pounds in 1918 to approximately 51,067,000 pounds in 1919, and shipments during the early part of the year were not sufficiently large to warrant expectation of any increase. The State's lead output dropped almost 50 per cent., or from 23,316,534 pounds in 1918 to 12,558,000 pounds. Larger shipments were made by some of the mines, however, during the first five months of 1920. The output of recoverable zinc decreased from 16,724,753 pounds in 1918 to about 8,182,000 pounds in 1919. However, there was a large increase in shipments of zinc concentrate early in 1920.

New Mexico

The largest copper company in New Mexico during the first three months of 1920 produced 3,540,000 pounds per month, a gain over the average monthly production of 3,527,000 pounds during the whole year of 1919. In May, 1920, the output was nearly 4,000,000 pounds. Accurate figures as to shipments of gold, silver, copper, lead and zinc for the entire State up to mid-year were not obtainable. The State Tax Commission of New Mexico reports that for 1919 the gross production of 36 metal-mining companies was $10,744,230, and that their gross expenditure was $10,710,910.

Oregon

Oregon's receipts during the first six months of 1920 showed a decrease of $204,769 in gold and 9803 ounces of silver. Gold received during this period in 1919 amounted to $303,565, and only $98,770 in 1920, a decrease of 67 per cent. Silver receipts amounted to 11,323 ounces during the first six months of 1919 and only 1520 ounces in 1920, a loss of 87 per cent. Losses in production were due mainly to unfavorable conditions in Baker and Grant counties, the first and third in rank, respectively, of the State's gold and silver producing counties. Shortage of water-power was also a contributing factor. The Geological Survey predicts, however, that gold production during the second half of 1920 will equal that of the last six months of 1919, and that silver production during the latter half will exceed that of the first half of 1920 by 50 per cent.

South Dakota

In its mid-year review of South Dakota mining conditions the Geological Survey says:

"The production of metals in the Black Hills district of South Dakota in 1920 has been confined almost exclusively to two mines, the Homestake and Trojan. The Homestake produced gold amalgam bars and cyanide gold bars, and the Trojan produced silver-gold cyanide bars and a few lots of smelting gold-silver ore. All the other gold properties were closed on account of high cost of mining.

"In December, 1919, the Homestake mine succeeded in extinguishing the fire which started September 25, 1919, above the top (sixth) floor of one of the small square-set stopes in pillar No. 3, north of the Star crosscut, on the 800-foot level. The mills were closed October 5, 1919, during the flooding of the mine. In January, 1920, 540 of the 1020 stamps in the mills of the company were dropping; in March 740 stamps, and in April 840 stamps were dropping. The company was able to keep all the mine and mill crews employed on surface improvements and exploration work, but as some of the mills were idle the production during the first six months of 1920 was not equal to the normal production. The Homestake mine produced $4,346,116 in 1919, as compared with $5,916,890 in 1918 and with $6,619,574 in 1917."

Utah

Utah's metal output increased slightly during the first half of the year. The 1919 output of gold, silver, copper, lead and zinc was valued at approximately $45,439,400, a decrease from

$86,047,597 in 1918. Gold production in 1919 totalled about $2,070,600, a decrease from $2,949,170 in 1918.

The silver output in 1919 was about 11,569,000 fine ounces, valued at $12,865,000, a decrease from 13,455,597 ounces in 1918. However, the 1919 production exceeded the 10-year average of 12,500,000 ounces.

Copper production of 1919 aggregated 123,626,500 pounds, valued at $23,241,782, a large decrease from that of 1918. No great change in output is indicated for the current year. Lead production fell from 167,008,224 pounds in 1918 to approximately 121,249,000 pounds in 1919, the lowest output in 10 years. Shipments of ore and concentrate from all mines averaged 8000 tons during the first 150 days of 1920.

Zinc fell from 18,399,417 pounds in 1918 to about 4,467,000 pounds in 1919. Utah's zinc production has ranged from 302,568 pounds of recoverable zinc in 1910 to 11,591,699 pounds in 1916.

Washington

The metal output of Washington during the first half of 1920 was comparatively small, especially that of gold and silver. The value of 1919 gold, silver, copper and lead was about $959,000, a decrease of $508,000. Washington mines in 1919 produced about $280,000 in gold, 300,000 ounces of silver, 1,321,000 pounds of copper, and 1,700,000 pounds of lead. Conditions during the first half of 1920 were unsettled.

Texas

If production is continued at the rate maintained for the first six months of 1020, the mines in Texas will produce during the year 500,000 ounces of silver, according to the United States Geological Survey. The principal mine in Texas is the Presidio, at Shafter, which has produced many millions of dollars' worth of silver from silver ores. The production of gold in Texas has always been small, amounting to only about $43,000 during the period from 1885 to 1918, but the production of silver during the same period exceeded 14,200,000 ounces, most of which has been taken from the Presidio mine.

Drawback Extended

The Treasury Department has extended the customs drawback regulations to cover solder, type metal, bar lead, lead pipe, lead wire, etc., manufactured by the Union Smelting & Refining Co., Inc., at its factory at Newark, N. J., with the use of imported lead, antimonial lead and antimony. The allowance of drawback, effective on and after November 15, 1919, will not exceed the quantity of imported material appearing in the exported articles.

BELIEVES IT HIS DUTY TO ATTEND A. M. C. ANNUAL CONVENTIONS

Dr. George Otis Smith, Director of the Geological Survey, before the House Committee on Appropriations, favored an allowance of expenses for the Director and members of the Survey in attending meetings of technical, professional and scientific societies when required in connection with their official work. He referred to having been appointed by the President as "a delegate on the part of the United States" to the American Mining Congress and then having to pay his own expenses.

"I believe it is my official duty to attend the American Mining Congress and to meet there the mining men who are interested in the industrial problems that I am interested in as a public official," said Dr. Smith.

He mentioned the fact that the coaol statistician of the Survey recently attended the meeting of the American Institute of Mining and Metallurgical Engineers in New York, where he presented facts of the coal industry, showing seasonal fluctuations in coal production which formed the basis of two days' discussion by mining engineers on that important subject, the delegate paying his own expenses. The Chief Geologist of the Survey presented a paper on oil at this conference and likewise met his own expenses. He suggested an appropriation of $10,000 to meet expenses of members of the Survey in attending meetings of which there were about 30 a year which should be attended by himself or some other member of the Survey. Expenses should also be allowed for attendance at important foreign meetings. The Director said he had attended three international geological congresses as an official representative of the United States and paid his own expenses.

Moves Office

The Roessler & Hasslacher Chemical Co. announces that its main office has been removed to more commodious quarters at 709-717 Sixth avenue, corner 41st street, New York, N. Y.

No longer may the up-to-date petroleum engineer, or even the large producer, confine his knowledge and efforts to a single oil field. The demands for the product, the fluctuations in the output and, in general, the need for supplementing decreasing output in one field by bringing in new fields elsewhere make it essential that the horizon be extended much more widely than formerly. Even the broad limits of the United States are no longer sufficient, and within the short space of three or four years the problem has become a world problem.

FEDERAL POWER COMMISSION ORGANIZES

The Federal Power Commission has perfected its internal organization plans. It will be subdivided into engineering, accounting, statistical, regulatory, licensing, legal and operation divisions. Hearings were held during the month upon the provisions of the bill respecting licenses and permits, preferences and priorities. Also a hearing was conducted, over which Secretary of War Newton D. Baker presided, concerning the financial aspects of power development. Many of the leading bankers of the country were present. It is understood that, as a result of these hearings, the commission will make a compilation of regulations which will be made public shortly.

H. O. Stabler of the Geological Survey and R. R. Randall of the Forest Service have been appointed by the executive secretary of the commission to complete regulations with respect to applications. C. E. Thorlow of the Alabama Power Co. is assisting this committee. Major Lewis W. Call of the Judge Advocate-General's office has been transferred to the commission and will serve as chief counsel. General Crowder, Major Call and Secretary Merrill will work up the regulations with respect to the financial features of the act. They are being assisted by a subcommittee from the National Electric Light Association, W. A. Brackenridge and Mr. Rippey of Los Angeles, and President Martin of the Alabama Power Co.

APPLICATIONS FOR LICENSE TO DEVELOP WATER-POWER

Forty-six applications for preliminary permit or license to develop hydro-electric power under the provisions of the Federal Water-Power Act had been filed with the Federal Power Commission, Washington, on September 1. Following is a list of applicants and locations of proposed water-power projects:

Alabama.—Alabama Power Co., Thomas W. Martin, president, Birmingham, Ala.; *Coosa River,* in *Alabama,* below Government Lock No. 2.

Alaska.—Speel River Power Co., E. P. Kennedy, president, 418 Foxcroft Building, San Francisco, Cal.; Tongass National Forest in Territory of *Alaska,* in vicinity of *Speel River.*

Tongass Alaska Pulp & Paper Co., by M. M. Lyter, attorney, 817-823 Alaska Building, Seattle, Wash.; utilization of Fish Creek, Swan Creek, Big Lake, Mirror Lake and Swan Lake for power purposes and authority to construct power plants and pulp and paper mill on the southeast shore of Carroll Inlet, in Southeastern Alaska.

Arizona.—C. A. Heberlein, Prescott, Ariz.; *Cataract Canyon,* Coconino county, Arizona.

Arkansas.—Dixie Power Company, W. V. Powell, president, 33 Metropolitan Building, Chicago, Ill.; *White River,* near Cotter, Baxter county, *Arkansas.*

California.—Pitt River Power Co., San Francisco, Cal., Messrs. Harr & Bates, attorneys, Westory Building, Washington, D. C.; *Pitt River, California.*

R. W. Hawley, Commercial Building, 833 Market street, San Francisco, Cal.; *Silver Creek and its branches,* in Eldorada county, *California.*

Beckman and Linden Corporation, *Colorado River,* in *Arizona* and *California.*

Florida.—The Cove Company, Ocala, Fla., J. D. Robertson, secretary and treasurer; *Withlachoochee River,* above Stokes Ferry.

Idaho.—G. W. Spoerry, Bonners Ferry, Idaho; *Moyie Falls,* on *Moyie River, Idaho.*

Utah Power & Light Co., Joseph Williamson, clerk, Augusta, Me.; M. O. Leighton, consulting engineer, McLachlen Building, Washington, D. C.; Soda Point, Lava, Narrows and Mink power sites on *Bear River, Idaho.*

Idaho Power Co., F. F. Johnson, president, Boise, Idaho, M. O. Leighton, consulting engineer; Upper Salmon Falls project on *Snake River, Idaho.*

Idaho Power Co., F. F. Johnson, president, Boise, Idaho, M. O. Leighton, consulting engineer; Twin Falls project on *Snake River, Idaho.*

Illinois.—State of Illinois, by Governor Frank O. Lowden, Springfield, Ill.; *Des Plaines* and *Illinois Rivers.*

Minnesota.—J. D. Markham, A. Kelsey and J. F. Druar, 512 Globe Building, St. Paul, Minn.; Kelsey-Markham-Druar Dam site on *St. Croix River,* between *Minnesota* and *Wisconsin.*

St. Cloud Water-Power Co., A. G. Whitney, president, St. Cloud, Minn.; to construct dam across *Mississippi River* at any point between Sec. 7, T. 123, R. 27, in County of Stearns and State of Minnesota, and Sec. 25, T. 35, Range 31, and Sections 30 and 31, in T. 35, Range 30 W., in Sherburne county, Minnesota.

Missouri.—W. R. Banks, Lock Box 1005, Lamar, Mo.; *Osage River,* between towns of Warsaw, Benton county, Missouri, and Tuscumbia, Miller county, Missouri, and *Niangua River,* between towns of Hahatonka, Camden county, Missouri, and mouth of the *Little Niangua River,* in Camden county, Missouri.

Western Tie & Timber Co., Warren C. Nixon, vice-president, 905 Syndicate Trust Building, St. Louis, Mo.; preliminary permit for power project on *Current River, Missouri,* in Ripley, Carter and Shannon counties.

Montana.—Rocky Mountain Power Co., Charles MacGreor, president, Butte, Mont.; *Flathead River,* from the outlet of Flathead Lake to the intersection of Flathead River with the south line of Sec. 32, T. 19 N., R. 21 W., Montana Mer., *Montana.*

New Jersey.—The Canada Syndicate, Ltd., of Montreal, Canada, and Duncan, Young & Co., 111 Broadway, New York City, N. Y.; *Delaware River,* above the town of Belvidere, N. J.

New York.—City of Buffalo, A. W. Kreinheder, acting Mayor, Buffalo, N. Y.; *Niagara River.*

Henry Ford & Son, Inc., Dearborn, Mich.; Green Island, Government Dam at Troy, *New York, Hudson River.*

Louisville Power Corporation, Walter F. Wilson, president, Massena, N. Y.; Hugh L. Cooper, attorney; *St. Lawrence River,* from the west end of Croil Island (sometimes called Baxter's Island, or Upper Long Bault Island) westerly up the St. Lawrence River to the easterly end of Gooseneck Island, in the town of Louisville, County of St. Lawrence and State of New York.

Hydraulic Race Co., C. E. Dickinson, president, Lockport, N. Y.; *Niagara River, New York.*

Brady, Paul T., 165 Broadway, New York City, N. Y.; *Delaware River,* at a point between the village of Barryville, on the New York side, and the village of Shohola, on the Pennsylvania side of the river.

Lower Niagara River Power & Water Supply Co., J. J. Albright, president, Lewiston, N. Y.; Hugh L. Cooper, attorney: point about 500 feet south of the Michigan Central Railroad bridge, which point is about midway between Cleveland avenue and Niagara avenue, in the City of Niagara Falls, N. Y.; water to be returned to *Niagara River* at a point on the town of Lewiston, Niagara county *New York,* on Lot 29 of the Mile Reserve.

Messrs. Thomson & Porter, DeWitt Clinton, attorney, Buffalo Savings Bank Building, Buffalo, N. Y.; *Niagara Gorge.*

Bowen, Millard F., 117 Tennessee avenue N. E., Washington, D. C.; to divert water from Lake Erie and Niagara River and from watersheds between Lake Ontario and the Hudson River.

Niagara County Irrigation & Water Supply Co., Edward Randell, president, Lewiston, N. Y.; *Niagara River, New York.*

Niagara Falls Power Co., Paul A. Schoellkopf, president, Niagara Falls, N. Y.; to divert water from *Niagara River* above the Falls, under the provisions of the treaty between the United States and Great Britain, proclaimed May 13, 1910.

Niagara, Lockport & Ontario Power Co., Fred D. Corey, president; Hugh L. Cooper, attorney, Farine Trust Co. building, Buffalo, N. Y.; above the *Falls at Niagara.*

St. Lawrence Transmission Co., F. A. Stoughton, president, Potsdam, N. Y.; *St. Lawrence River* in vicinity of Long Sault Rapids, St. Lawrence county, *New York.*

Messrs. Thomson & Porter, DeWitt Clinton, attorney, Buffalo Savings Bank Building, Buffalo, N. Y.; *Niagara River, New York.*

Niagara Gorge Power Co., Bert L. Jones, vice-president, 604 Ellicott Square, Buffalo, N. Y.; *Niagara Falls, Niagara River, New York.*

Oklahoma.—C. P. Chenault, Tulsa, Okla.; *Arkansas River,* at a point commonly known as Ox Bow Bend, northwest of Tulsa, Okla.

Oregon.—Grown Willamette Paper Co., Pittock Block, Portland, Ore.; Falls of *Willamette River,* West Linn, *Oregon.*

Pennsylvania.—W. A. Dromgold, York, Pa.; *Susquehanna River,* at or near Cumberland, below the mouth of Yellow Breeches, Pa.

Virginia.—Roanoke River Development Co., H. G. Buchanan, president, 318 Mutual Building, Richmond, Va.; *Roanoke River,* in Mecklenburg county, Virginia, between Bugg's Island and the town of Clarksville in said county.

Washington.—Washington Irrigation & Development Co., H. J. Pierce, president, 905 White Building, Seattle, Wash.; Priest Rapids, *Columbia River, Washington.*

Alex. Polson, M. E. Reed and W. H. Abel, Montesano, Wash.; headwaters of *Wynooche River,* in Olympic National Forest, *Washington,* and northeastern part of Gray's Harbor.

Hugh L. Cooper, 101 Park avenue, New York City, N. Y.; Clark Fork of the *Columbia River, Washington.*

Sound Power Co., H. O. Pond, president, 25 Broad street, New York City, N. Y.; *Sultan River* and *Olney Creek,* in Snohomish county, *Washington.*

Straits Power Co., H. O. Pond, president, 25 Broad street, New York City, N. Y.; *Solduc River, Crescent Lake* and *Lyre River,* in Clallam county, *Washington.*

Northwestern Power & Manufacturing Co., Donworth, Todd & Higgins, attorneys, Hoge Building, Seattle, Wash.; Lake Crescent, in Clallah county, *Elwha River,* in *Washington.*

Priest Rapids Irrigation District, by W. J. Kincaid, president, White Bluffs, Wash.; Priest Rapids of *Columbia River, Washington.*

West Virginia.—Tri-State Power & Milling Co. of West Virginia, Tri-State Power Co. of Virginia, O. L. Stearnes, president, Salem, Va.; below Anderson Falls of *New River,* in Summers county, *West Virginia.*

POWER SURVEY STAFF NAMED; TWO BUREAUS TO CO-OPERATE

The Sundry Civil Act for this fiscal year carries an appropriation to the United States Geological Survey "for a survey of power production and distribution in the United States, including the study of methods for the further

utilization of water-power and the special investigation of the possible economy of fuel, labor and materials resulting from the use in the Boston-Washington industrial region of a comprehensive system for the generation and distribution of electricity to transportation lines and industries."

This power survey, which is, in fact, a by-product of war work of the Geological Survey, is now being actively organized and pushed by that bureau. A special engineering staff has been organized with headquarters at 709 Sixth avenue, New York. The staff is headed by Wm. S. Murray, consulting engineer of New York. The other members of the staff are Henry Flood, Jr., engineer-secretary; L. E. Imlay, electrical engineer of Niagara Falls, division engineer, power and transmission; H. W. Butler, mechanical engineer of New York, division engineer, industries; Cary T. Hutchinson, consulting engineer, New York, division engineer, railroads. These men will be assisted by Lyle A. Whitsit, H. Goodwin, Jr., Norman C. McPherson and others.

The engineering staff will be assisted by an advisory board, of which the following members have already been appointed by Secretary Payne: L. P. Breckenridge, head of mechanical engineering department, Yale University, representing fuel engineering, chairman; E. G. Buckland, vice-president N. Y., N. H. & H. R. R., representing New England railroads; A. T. Hardin, vice-president of New York Central Railroad, representing New York railroads; J. H. McGraw, president McGraw-Hill Book Co., representing technical publicity; J. H. Pardee, president of the J. G. White Management Corporation, representing the American Electric Railway Association; M. W. Alexander, managing director of the National Industrial Conference Board, representing that board; R. H. Aishton, president of the Chicago & Northwestern Railway and of the American Railway Association, representing the association, and Arthur D. Little of Arthur D. Little, Inc., representing the electro-chemical and by-products industries. Two additional men will be appointed to the board representing the National Electric-Light Association.

The regular personnel of the two bureaus of the Department of Interior concerned, namely, Geological Survey and Bureau of Mines, are represented on the engineering staff by N. C. Grover, chief hydraulic engineer, Geological Survey, and O. P. Hood, chief mechanical engineer, Bureau of Mines. With Professor Breckenridge on the advisory board and Mr. Hood on the engineering staff, full recognition will be given to important fuel problems related to the investigations. Mr. Hood will be directly responsible for the coal-mining studies necessary to the question of establishing mouth-of-mines power stations.

LEASING ACT EFFECTIVE WHOLE DAY FEBRUARY 25

Secretary of the Interior Payne has ruled that the leasing act of February 25, 1920, was in force and operation during the entire day, subject, however, to the privilege of any person having a substantial right which would be affected by the application of the general rule of law to this effect to prove, if he can, the exact time the measure received the President's signature. His ruling follows:

"All locations made or applications filed, pursuant to Section 13 of the Act of February 25, 1920, at any time during the day of February 25, 1920, will be held, treated and regarded as simultaneous, and in case of conflict of location and application, in whole or in part, betwen two or more qualified applicants, all such applicants will be allowed 30 days from notice within which to compromise their differences by division of lands or otherwise, in default of which this Department will make such division or disposition as the facts may warrant."

The Act of February 25 authorizes the Secretary of the Interior, under such rules as he may prescribe, to grant prospecting permits upon not to exceed 2560 acres of land and permits would-be applicants to initiate preference rights, good for 30 days, by posting notice upon the ground. Neither the statute nor the rules and regulations promulgated thereunder confer upon locators the right to obtain a prospecting permit for the entire acreage described in any notice of location. The statute merely limits the maximum acreage which may be embraced in a single permit. Paragraph 2 of the regulations approved March 11, 1920, states that the granting of permits "is discretionary with the Secretary of the Interior, and any application may be granted or denied, either in part or its entirety, as the facts may be deemed to warrant."

It is known that in some instances notices were posted on the day the President signed the bill, but at an hour before he actually affixed his signature, while in other instances prospectors awaited receipt of telegraphic advice that the measure had been approved and immediately thereafter posted notices upon the land. These circumstances made the rendition of an opinion by the Secretary of the Interior necessary.

Following is a digest of recent rulings in relation to oil and gas permits and leases:

Discovery on Adjoining Claims

In case of two claims that adjoin, it is necessary to have discovery on each claim to secure lease for both under Section 18. If the discovery is only on one claim the lease must be confined to the limits of the claim containing the discovery.

Assignee's Right to Lease

The grantee of good faith locators may transfer his interest to contractors, assignees or lessees who were in possession prior to

July 1, 1910, and each of such owners may then apply for a lease of such portion of the claim as may be agreed upon among those entitled to the claim as a whole. This is contingent upon the condition that grantee of locators has not been holding more than the maximum allowed under Section 18 of the leasing act.

The following permits have been issued since August 1:

Montana.

Lew L. Callaway, Billings, 240 acres.
Geo. B. White, Lewistown, 320 acres.
Riva Plata Petroleum Association, Lewistown, 160 acres.
Eulala Oil and Gas Association, Lewistown, 120 acres.
Catlin Dome Oil and Gas Association, Lewistown, 160 acres.
Bonanza Oil and Gas Association, Lewistown, 125.69 acres.
Frank Morgan, Lewistown, 640 acres.

California.

J. W. Fisher, Independence, 1280 acres.
Will J. Stanton, ndependence, 1280 acres.
Gwin S. Butler, Independence, 2560 acres.
W. A. Sage, San Francisco, 1200 acres.
Clara G. Arwood, Los Angeles, 2560 acres.
Nellie G. Wilson, Los Angeles, 2560 acres.
Clarence G. Atwood, Los Angeles, 2560 acres.
Cora P. Morris, Los Angeles, 2520 acres.
Frank Hall, Los Angeles, 2400 acres.
James B. Adair, Los Angeles, 2275.90 acres.
Ruth E. McCormick, Los Angeles, 2560 acres.
Elizabeth W. Perry, Los Angeles, 2240 acres.
Kramer Consolidated Oil Co., Los Angeles, 2560 acres.
J. D. Bell, W. H. Everhard and W. O. Webster, Independence, 2560 acres.
C. C. Newkirk, Independence, 2560 acres.
D. H. Bean, Independence, 2560 acres.
John E. Alexander, San Francisco, 120 acres.

New Mexico.

Herbert Chesbro, Santa Fe, 2440 acres.
Geo. H. Hook, Santa Fe, 2240 acres.
Willis H. Collins, Ft. Sumner, 2240 acres.
W. M. Edwards, Las Cruces, 2560 acres.
E. C. Rice, Las Cruces, 2560 acres.
Edward C. Wade, Las Cruces, 2560 acres.
Thomas F. Crohan, Las Cruces, 2560 acres.
E. C. Wade, Las Cruces, 2560 acres.
C. J. Mapel, Las Cruces, 2560 acres.
C. V. Nafe, Las Cruces, 2560 acres.
J. W. Stewart, Las Cruces, 1920 acres.
J. H. McLaughlin and Ray W. Stewart, Las Cruces, 2560 acres.
Charles Henry Goard, Ft. Sumner, 2400 acres.
Marshall F. Hobson, Ft. Sumner, 2560 acres.
Lunford P. Schency, Ft. Sumner, 2560 acres.

Nevada.

Sidney E. Allen, Carson City, 2560 acres.
John K. Miller, Carson City, 1800 acres.
W. A. Browne, George W. Elliott and John R. Jones, Carson City, 240 acres.
Geo. Ernst, Carson City, 2560 acres.
Charles B. Hall, Carson City, 640 acres.
Grace Porter, Carson City, 2560 acres.
Mary A. Colburn, Carson City, 120 acres.
A. J. Burke, F. W. McPherson, J. A. Roth and Frank Hartung, Carson City, 1920 acres.
Earl B. Stuver, Carson City, 2560 acres.
Elbert Allen, Carson City, 2560 acres.
Clarence W. Crehore, Carson City, 1280 acres.
R. N. Stuver, Carson City, 2160 acres.
W. E. Harrison, Carson City, 2560 acres.
Frank Harriman, Carson City, 1920 acres.
Andrew Aiken, Carson City, 1280 acres.

Wyoming.

Paul B. Gaylord, Cheyenne, 1800 acres.
F. F. Kelley, Cheyenne, 2560 acres.
J. W. Wisda, 640 acres.
Herbert H. Morrill, Lander, 640 acres.
E. Dana Carter, Lander, 320 acres.
Clara F. Collins, Buffalo, 1162.70 acres.
Stanley F. Gorman, Buffalo, 640 acres.
George Best Crisman, Buffalo, 640 acres.
Michael J. Keane, Buffalo, 640 acres.
Thos. W. Brahany, Buffalo, 480 acres.

Arizona.

Charles Sauer, Phoenix, 2560 acres.
Thos. C. C. Oswald, Lander, 320 acres.

Utah.

Ernest S. Cowie, Salt Lake City, 1280 acres.
William J. Tidwell, Salt Lake City, 1280 acres.
Jesse W. Seeley, Jr., Salt Lake City, 1280 acres.

Idaho.

B. F. McCune, Lewistown, 400 acres.
Russelle E. Barrett and William J. Barrett, Lewistown, 240 acres.
Henry E. Bowles, Hailey, 1875.60 acres.

Colorado.

Prince E. McCracken, Denver, 80 acres.

New Mexico.

Clinton B. Weegs, Santa Fe, 640 acres.
Jerry B. Farris, Santa Fe, 640 acres.
John R. Magill, Santa Fe, 640 acres.

A new compilation of oil and gas regulations will be published very shortly by the Interior Department. Copies of these regulations will be furnished to our members by the American Mining Congress.

TRADE PRACTICE SUBMITTAL ON PRICE DECLINE GUARANTEE

The Federal Trade Commission will hold a trade practice submittal on the subject "Guarantee Against Decline in Price" at its Washington office on October 5. Questionnaires to the number of 2000 have been sent out to purchasers, manufacturers, merchants and consumers, inviting them to express their opinions in advance and later to participate in the hearing. Answers have been received from more than 50 major lines of industry, including tin, brass and bronze, iron and steel, petroleum and the construction industries, as well as from many trade associations.

A trade practice submittal, as defined by the Federal Trade Commission, is a meeting of a whole industry or group of industries in the presence of the commission to discuss merits

and demerits of business practices which have been complained of to the commission, to the end that expert expressions of opinion by the industry as to the fairness or unfairness of various competitive methods may be crystallized and recorded, the findings of the meeting being accepted by the commission as the judgment of the trade as to a given practice. The commission does not participate in the meeting except to ask questions.

In explaining the effects of such a round-table discussion the commission made the following statements to recipients of invitations: "If the practically unanimous opinion of the representatives of the business world condemns a given practice, the commission receives that expression of the industry as being founded on expert knowledge and business experience with respect to the condemned practices, and likewise the sanctioning of a practice by the industry, even though the propriety of that practice has been questioned by application for the issuance of a complaint, is similarly regarded as being the expression of industry based upon experience and business judgment.

"Such a practically unanimous expression on the part of a representative body of an industry is given great weight by the commission in considering such practices. It should be understood that it represents no decision or judgment on the part of the commission, and is in no sense binding upon anyone not present at the meeting. Nor, indeed, is it binding upon anyone who is present at the meeting but who dissents from the majority opinion. The effect is that the weight of the opinion of the industry has been communicated to the commission, and that thereafter the commission will feel it to be its duty, in case complaints are made to it of a continuance of the condemned practices, to issue its formal complaint, after inquiry and the public interest determined, in order that by means of a formal and orderly proceeding with an opportunity for subsequent court review, the judgment of the meeting may be subjected to the final test of the courts. Also, in case of a division of opinion on any given practice, the commission considers the question to be so much in doubt that it should be left entirely open to be challenged, if anyone desires to challenge it, and made the subject of a more formal proceeding.

"To sum up, then, the trade practice submittal amounts to a request on the part of the commission to a given industry or industries that an opinion be given with respect to the fairness or unfairness of any trade practices which have grown up or are growing up, and that this opinion is received by the commission as the best and most authoritative judgment then obtainable, but that this judgment may be challenged by any party in interest and thereafter may be made the subject of a more minute examination in a proceeding around which are thrown all the safeguards of a proceeding in court."

SEWALL'S POINT CLASSIFICATION MAY STANDARDIZE COAL TERMS

Fulfillment of a co-operative agreement entered into between the United States Bureau of Mines and the Sewall's Point Coal Exchange, Inc., will result in the first scientific classification of an entire coal field ever made by the Bureau. The investigations, which will require from three to six months, may also lead to the adoption of a definite set of terms for expressing the grade and classification of bituminous coal—terms whose meaning will be identical, irrespective of the field to whose coal they may be applied, and which will be understood alike by laymen and professional men everywhere.

The need of thorough classification, based upon scientific analyses, of the entire field along the Virginian Railway has long been felt by the Sewall's Point Coal Exchange, Inc. With this idea in mind, the exchange a few weeks ago retained J. S. Burrows, engineer, of New York. After surveying the situation for a month, Mr. Burrows suggested the co-operative agreement which was entered into between Dr. F. G. Cottrell, director of the Bureau of Mines, and G. H. Caperton, president of the Sewall's Point Coal Exchange, Inc., and approved by the Secretary of the Interior.

This agreement sets out that the Bureau and the exchange desire to "conduct investigations concerning the preparation of coal with a view of increasing efficiency in use and economic development of the industry by improving the grading and classification of coal shipped to tidewater pools," and contains the following stipulations respecting the actual work to be done:

Co-operative Agreement

1. All work herein described shall be directed by the Bureau of Mines according to a program as mutually agreed upon between the Bureau and the exchange, and all methods employed shall be the standard methods of the Bureau of Mines.

2. In the district to be investigated the Bureau agrees to complete a list of mine samples and analyses.

3. The Bureau agrees to obtain at the mine-tipple, point of delivery, or other place as agreed upon, representative samples of the commercial coal as shipped by the several mines.

4. The Bureau agrees to furnish the necessary portable field equipment for the samplers.

5. The Bureau agrees to make, at its Pittsburgh laboratory, approximate analyses and B. T. U. determinations of all samples which are acceptable to the Bureau, and ultimate analyses and fusing temperature of ash determinations of such analyses as may be mutually agred upon. Reports of the laboratory determinations will be furnished the exchange

as soon as made, together with such information as appertains thereto.

6. All analyses may be published by the Bureau of Mines, due credit being accorded the exchange for its co-operation, but the exchange shall have the privilege of prior publication in a form mutually agreed upon for the confidential information of members of the exchange.

7. The conduct of all the foregoing described work shall subject the Bureau of Mines to no expense other than for general direction. To this end the exchange agrees to pay salaries, subsistence and traveling expenses of field men engaged in taking mine samples while so engaged; to pay the salaries and expenses of samplers obtaining commercial samples, and to furnish all necessary labor and such heavy appliances as may be needed in the sampling, and to pay the salaries of men engaged in laboratory work to the extent of the actual cost of such analyses made for the exchange.

8. The extent of this program as to number of men employed and amount of work undertaken shall be a matter of mutual agreement in writing between the exchange and the Bureau.

9. It is mutually understood that this agreement shall be effective after being signed by the parties thereto, upon its approval by the Secretary of the Interior, and that it shall continue in effect until the work herein contemplated shall have been completed, provided that at the end of six months the agreement can be terminated by either party upon not less than 30 days' notice to the other party.

The last classification of mines along the Virginian Railway was made by the Tidewater Coal Exchange, and was continued under the direction of the Fuel Administration, and, with a few modifications, it still obtains. This classification is not satisfactory, because it is not based on scientific analyses. The Bureau of Mines intends to take samples of coal from the face of the seam and from the tipple as it is being loaded from every mine along the Virginian Railway sending its coal to Sewall's Point, and later to take samples also at the point of delivery, and to classify the product of each mine with respect to amount of volatile matter and fixed carbon, sulphur and moisture content, ash residue and B. T. U.

Simplification of System

While the adoption of a set of terms, universally understood, is not the object of the co-operative work to be done at Sewall's Point, it is considered by some of the Bureau of Mines experts that progress along that line may be one of its by-products. Advantages of scientific analyzation of all coals, and use of a vocabulary of classification universally understood, are obvious. If a merchant should tell a prospective customer that of two gold rings offered for sale, the metal in one was mined in Colorado and that in the other came from Idaho, he would not convey to the customer any idea whatever of the relative value of the two pieces of jewelry, or even of the actual worth of either. But if he should say that one ring contained a certain weight of 14-carat gold and the other an equal weight of 18-carat gold the customer would at once recognize a difference in values. Likewise such terms as "Pool 1, Tidewater Classification," and "Pool 3, Tidewater Classification," convey very little meaning, since they do not imply any particular amount of volatile matter, fixed carbon, sulphur, ash or moisture or any approximate number of B. T. U. But if the term "No. 1," for instance, were known to apply only to coal containing volatile matter, fixed carbon, sulphur, ash and moisture, and B. T. U. varying in amounts only within a definitely established maximum and minimum range, it would be readily understood. Whether the number of varieties of coal is too great to permit the placing of every mine in a class with some other mine, or mines, remains to be decided. But if the system is eventually worked out it will be possible for producer, dealer and consumer to know the specification of any coal, irrespective of the location of the mine from which it is taken, by ascertaining its classification.

The Bureau of Mines has made analyses of coal for foreign governments upon frequent occasions. It analyzes all shipments to the Panama Railway. It is the hope of the Bureau that operators all over the country will seek co-operative arrangements similar to the one which has just been entered into with the Sewall's Point Exchange, and that eventually every American mine will be definitely classified on a scientific basis.

JOHN GEORGE LEYNER, PIONEER MINING APPLIANCE INVENTOR

John George Leyner of Denver, Col., was killed by an automobile accident near Denver on August 5. Mr. Leyner was an American genius of exceptional ability, a pioneer in rock drilling and mining appliances, and an inventor who has contributed much to the industrial progress of his age. No man, in fact, has done as much in the past generation to advance the art of removing rock. Through his inventions the rock drill has passed from the percussive stage, involving machinery of heavy weights, to the hammer stage, where the rock drill has become a thing but little larger than a pneumatic tool. To Ingersoll, Joseph Githens and Sergeant belongs the credit for the development of the percussive or piston type of rock drill. During this development, and up to an early period following 1900, engineers considered it impracticable to build a rock drill on any plan other than that involving a rigid and direct connection between the steel carrying

the bit and the piston; that is, the drilling bit was an extension of the piston rod. To make a rock drill on this plan and reduce its weight to a point consistent with practical handling in mines and slopes, to simplify it in its mechanism, and to make it stand up against hard usage were problems that taxed the best energies of inventors between 1870 and 1900. Henry C. Sergeant came to the front and is the recognized leader in the perfection of the piston type of drill.

Mr. Leyner was the first to attack this system. He pointed out what was generally admitted, that the piston type was necessarily heavy, that it was limited in drilling capacity because of the limit to the number of strokes it could make, and he advocated and patented the use of the piston as a hammer only, to strike the end of the steel or an intervening medium connected with the steel. He introduced a water jet through the piston into the bit for clearing the hole cuttings. His system patent was taken out in 1903 and his method patent in 1904.

Incorporating the Leyner Engineering Works in 1902, Mr. Leyner built shops at Littleton, Col., soon thereafter. Engaged as he was in pioneer work, developing a new and radical principle in the art of drilling, he encountered many obstacles, mechanical and financial. To build a drill on the Leyner principle required not only superior excellence of design, but the material and workmanship, unless of the highest quality, would naturally result in breakages and excessive wear and tear. For a period of 12 years, in spite of difficulties and successful attacks made upon his drill by the old and leading companies—the Ingersoll-Sergeant Drill Co. and the Rand Drill Co.—Leyner stuck to his guns, until in 1911 the Ingersoll-Rand Company took over all his patents and inventions, transferred the manufacture to their works at Phillipsburg, and the Leyner-Ingersoll type of drill was from that time a standard. It has often been said that all that the genius of Leyner required was the experience and mechanical skill of the Ingersoll Company to make a success of this new principle. The Jackhammer, which might almost be placed in one's overcoat pocket, is built on the Leyner principle. This is the most generally used rock drill of today, not only in America, but throughout the world. The water Leyner, now known as the Leyner-Ingersoll, is now widely used, replacing entirely the old piston type of drill for mining and tunnelling. It holds the world record for fast tunnel driving.

Leyner's other inventions include the drill sharpener, now recognized as the simplest form of sharpener and the one most widely used throughout the world. It has been estimated that this sharpener is used for sharpening about 90 per cent. of all the machine-sharpened steel in the world. Leyner also invented the Little Tugger hoist used in mines and shipyards. He built the original machines used for producing shredded wheat. His latest invention is the "Linapede" or Leyner Farm Tractor. He was engaged in the development of this tractor at the time of his death.

Mr. Leyner was born in Boulder county, Colorado, in 1860, being the first white child born in that county. He was the son of Mr. and Mrs. Peter A. Leyner. He leaves a widow and three adopted children.

A product of the great West, Leyner was a man of strong physique, a worker with his hands and his head, and stubborn and determined in having his way. It was this faculty which helped him bring his radical idea about the rock drill to the point of fruition. Most men would have given up against such difficulties as he encountered. He was not an easy man to get along with, for he would brook no interference with his authority. Like most inventors, his main strength was mechanical, though, unlike most inventors, his vision was laid on practical lines and in advance of conventional things.

The mining industry owes much to Leyner's genius, the world much to the mining industry. To have reduced the cost of removing rock and ore, as Mr. Leyner has done, is an achievement which should place him at the front among America's great inventors.

RIGHT OF APPEAL FOR WAR MINERALS RELIEF CLAIMANTS

War Mineral Relief claimants in large number appeared before Secretary Payne on August 10 for conference to determine the status of the War Minerals Relief Commission and the attitude of the Secretary on the four questions:

Request and demand,
Commercial importance,
Net losses,
Purchase of property,

and to determine the attitude of the Department toward the bill now pending in Congress to grant these claimants the right of appeal to the Court of Claims. The hearing was opened by the statement of Herbert Wilson Smith, Chief of the War Minerals Division, on behalf of the claimants. Edgar Watkins, attorney for the Chestatee Pyrites & Chemical Co., made a vigorous statement on behalf of his claimants and in opposition to the ruling and attitude of the Commission in their handling of this particular case. Henry R. Harriman requested from the Secretary a statement concerning the status of the Commission, inquiring specifically as to whether the Commission was engaged in defense of the Government, or whether it was engaged and should act in the capacity of a nisi prius court. This was followed by a detailed statement from Mr. Smith concerning the present bill to grant claimants an appeal to the Court of Claims, in which it was particularly pointed out that

the existing law gives the Government the right of appeal to any of its duly constituted branches, including the Court of Claims, in opposition to the award granted any claimant, and does not give the claimant any right of appeal in opposition to any award granted to the Government. It was also pointed out that claimants under the first section of the same act in claims to the War Department already have this right of appeal.

Senator Shafroth, Chairman of the Commission, stated that the work of the Commission had been arduous and thoughtful and designed to give such relief as the interpretation placed upon the law would permit. Secretary Payne stated that the work of the Commission had been painstaking and careful and that he personally had gone into the merits of several cases and had given personal consideration to the whole situation.

At the conclusion of the hearings, Secretary Payne agreed:

First—To write a letter to Congress stating that the Interior Department had no objections and offered no opposition to the passage of the bill giving the claimants the right of appeal to the Court of Claims.

Second—He agreed also to choose with the consent of the claimants typical cases covering typical points on which decisions should be based, and upon agreement with the claimants to hear these typical cases personally in an effort to arrive at decisions on the mooted points.

He further agreed to hear any case on appeal on which the claimant felt that he had not received justice.

ORGANIZE NEW MEXICO CHAPTER OF AMERICAN MINING CONGRESS

The need for a New Mexico chapter of the American Mining Congress has been so apparent for years and its organization has been urged so frequently that it is gratifying to learn that such a movement is now on foot. It has been easy to make the needs of the industry in its unorganized condition somewhat of a political football in State politics. An organization which would place the economic status and importance of the industry foremost and remove it from the political arena would be most welcome to everyone interested in mining this large and so comparatively undeveloped region of the Southwest. Such a movement has been undertaken, and it is apparent that a substantially organized chapter of the Mining Congress to include the entire mining industry of the State and to express its best thought and most worthy ideals will soon be well established. Of the first steps in this movement, the Silver City Enterprise has the following to say:

A two-day session of the mine operators of New Mexico in Silver City Monday and Tuesday of this week, resulted in the organization of the New Mexico Mining Association, preliminary to the making of an application for a charter for a State chapter of the American Mining Congress. More than 30 leading mining men of the State were in attendance. John M. Sully, manager of the Chino Copper Company's operations at Santa Rita and Hurley was chairman.

The meeting named a special committee to meet with the Special Revenue Commission in Santa Fe, August 18. This committee is composed of G. A. Kaseman, Albuquerque; E. M. Sawyer, Tyrone; C. T. Brown, Socorro; I. J. Stauber, Lake Valley; Robert I. Kirchman, Silver City; P. H. Argall, Magdalena; Gregory Page, Gallup; and Mr. Sully. The committee which had instructions to complete data relating to taxation matters for presentation to the State commission, held preliminary meetings in Silver City this week, following the adjournment of the general meeting Tuesday afternoon.

The New Mexico Mining Association chose John M. Sully as chairman, and Mr. Sully's assistant, N. C. Cross, as secretary, with authority to take necessary steps toward the perfection of the organization so that application for a State charter may be made to the American Mining Congress. The executive committee consisting of ten members was appointed as follows: B. N. Hanger, Albuquerque; Powell Stackhouse, Jr., San Antonio; S. J. Kidder, Mogollon; E. M. Sawyer, Tyrone; Ira L. Wright, Silver City; C. T. Brown, Socorro; J. B. Gilchrist, Fierro; M. W. Porterfield, Silver City, and John M. Sully, chairman, ex-officio member. Burton Bunch, secretary of the Grant County Chamber of Commerce, was appointed secretary to the executive committee, with instructions to correspond with the American Mining Congress concerning a State charter.

A State-Wide Representation

The mining men in attendance are as follows: O. Wiser, president Metal Exploration Company, Hurley; Arthur Thacher, New Jersey Zinc Co., St. Louis, Mo.; K. A. Strand, Empire Zinc Co., Hanover; A. R. Flinn, Empire Zinc Co., Hanover; E. P. Seeley, superintendent Mexarko Mining Company, Silver City; M. W. Porterfield, Silver City; G. A. Kaseman, president Albuquerque & Cerrillos Coal Co., Albuquerque; W. C. Porterfield, Silver City; Powell Stackhouse, Jr., Carthage Fuel Co., San Antonio; E. M. Sawyer, manager Phelps Dodge Corporation, Tyrone; L. M. Kniffin, manager Hanover Bessemer Iron & Copper Co., Fierro; B. H. Kinney, Tokay, N. M., coal mining; I. J. Stauber, Lake Valley; O. F. Riser, superintendent of mills, Chino Copper Co., Hurley; Horace Moses, general superintendent Gallup American Coal Co., Gallup; B. B. Hanger, general manager Diamond Coal Co., Albuquerque; A. L. Owen, vice-president Mimbres Mining Co., Santa

Rita; R. I. Kirchman, Silver City; John M. Sully, general manager Chino Copper Co., Santa Rita; F. J. Anderson, acting superintendent Chino Copper Co., Hurley; G. L. Webster, cashier Chino Copper Co., Hurley; D. W. Boise, mill clerk Chino Copper Co., Hurley; S. J. Kidder, Mogollon Mines Co., Mogollon; E. C. Stimson, Empire Zinc Co., Denver; Gregory Page, Gallup; J. F. Woodbury, Silver City; Percy Wilson, Silver City; N. C. Cross, Hurley; F. W. Vollacott, Silver City; E. E. Ellinwood of Ellinwood & Ross, Bisbee, Ariz.; H. C. Denney, Gallup, and C. A. Moore, Empire Zinc Co., Hanover.

METAL PRICES HOLD WHILE FOOD AND TEXTILES SOAR

Wholesale prices of minerals and metals, especially coal, advanced less during the war and remained at lower and more nearly stationery levels during the entire period of hostilities than did those of either food or clothing. In the spring of 1919, when food and clothing prices began their record ascension, which continued well into the current year, minerals and metal prices started in the opposite direction, and in March, 1920, when consumers were complaining of food and clothing prices more than three times those of the pre-war period, wholesale prices of coal and other minerals and metals ranged from 90 to barely 60 per cent. above 1914 quotations.

Anthracite coal advanced less during the six-year period, and sustained a lower level of advance as late as March, 1920, than any other commodity compared by the Bureau of Labor Statistics of the Department of Labor. Bituminous and other minerals and metals from January, 1918, to May, 1919, maintained levels almost as far behind those of other commodities as they were ahead of those of anthracite. While animal foods receded to the levels of bituminous and other minerals and metals in March, 1920, the discrepancy between the latter and vegetable foods, textiles and leather goods was even more marked.

Using 100 as the pre-war figure, the Government found the following wholesale advances prevailing in March, 1920:

Commodity.	Per cent. increase.
Anthracite	60.3
Bituminous	86.4
Animal foods	87.9
Minerals and metals (excluding coal)	91.3
Vegetable foods	191.0
Textile and leather goods	218.9

Anthracite advanced less during the period than any other commodity, and its quotations were devoid of that wide range of fluctuation which marked wholesale prices of everything else. The 60 per cent. advance recorded in March had been maintained steadily for six months, and this advance itself represented the highest price at which the commodity had been wholesaled since July, 1914.

DANGERS FROM EXPLOSIVES FUMES IN METAL MINING

By D. Harrington, Supervising Mining Engineer, Bureau of Mines,
and
B. W. Dyer, Metal Mining Engineer, Bureau of Mines.

Two recent occurrences in Western metal mines in each of which three men were killed, due to breathing fumes from explosives, have aroused keen interest among mining men not only as to the exact cause of such accidents, but also as to possible preventive measures.

In sinking the 45-degree incline Marsh shaft near Burke, Idaho, on May 13, 1920, a round of holes containing about 60 pounds of 40 per cent. gelatin explosive was blasted by the night shift upon leaving at 11.30 P. M. It was customary for the night shift to leave compressed-air blowers open at bottom of shaft until the compressor was shut down slightly before midnight. Presumably this was not done on the night of the 13th, as the fumes were so heavy in the shaft bottom on the morning of the 14th that at about 8 o'clock Superintendent Bergen and one of the shaft men, on reaching the shaft bottom, were overcome and fell from the bucket into the sump containing about six feet of water; and when two other men went down in the bucket a few minutes later to investigate, one also fell into the sump, and the other was barely able to reach the shaft collar. The three bodies were later on recovered from the sump.

At 4.50 P. M. June 10, 1920, at the Dominion Mine, Colville, Wash., a round of 11 holes, containing about 15 pounds of 60 per cent. nitroglycerine explosive, was blasted in a 50-degree raise about 50 feet above the main tunnel level by the shift going off for the night. In this mine it was the practice not to try to blow out the fumes until just before the shift went to work the next morning. Although no work was being done on the night shift, one of the raise men, curious to ascertain the effect of the shots, about 7.45 P. M. wandered into the mine (which was a tunnel only a few hundred feet in length), and was missed by one of his companions about an hour later. When three men tried to remove the body of the inquisitive miner, two of them were also overcome; ultimately these two and the first man were removed from the point at which all were asphyxiated, which was practically at the foot of the raise.

In this case the explosive was seven-eighths *straight nitroglycerine*, used because the ordinary one and one-fourth gelatin was temporarily unobtainable, though the holes were drilled for the larger-sized stick. The explosive, too, was about a year old. While two of the eleven holes missed fire, there was no obtainable evidence of burning of explosive, but later on after blasting these two missed holes, containing possibly three pounds of the explosive, an air sample, taken a few minutes after blasting and essentially at the point at which

the three men had been asphyxiated, gave 0.79 per cent. CO, or sufficient to cause death after having been breathed a comparatively few minutes. It was thought locally that the deaths were due to other gases, but analyses indicate strongly that CO was responsible.

Danger Always Present

These accidents indicate forcibly a danger daily confronting men working in metal mines, and especially in small or prospecting mines. In one case the dangerous fumes were in a shaft, in the other a raise, the deaths in the latter case being, however, practically on the tunnel level. Compressed air constituted the usual method for removal of dangerous gases, annd in both cases it failed.

In both cases there is at present no obtainable evidence of defectiveness of explosive or of method of firing, hence the situations are practically such as may be encountered at any of our operating metal mines, especially those operating on a small basis, and the question arises as to possible prevention of such occurrences.

These two disasters are recent, and the loss of life makes them of serious concern, yet the situation brought out is one which confronts nearly all metal mines in the country, large and small. The Bureau of Mines has been asked to attack the problem from various points of view. Some companies having several mines and employing hundreds of men have numerous cases of "*powder gassing*" annually, frequently with fatal results, and have asked the assistance of the bureau largely as to the possible finding of methods of firing of explosives such that no poisonous fumes will be developed. Others wish experimental work along the line of developing a "*fool-proof*" supersafe explosive such that practically, irrespective of method of handling, surrounding conditions, etc., no dangerous fumes may be found, and still others, realizing the probability that dangerous fumes will be generated, irrespective of present-day available precautions, wish information as to positive methods of handling dangerous fumes with idea of their removal.

In Complete Combustion

Theoretically, there are in existence today explosives with constituents chemically balanced such that with complete detonation there should be no resultant gases of more potential danger than CO_2, which, mixed with the almost invariably larger quantities of ordinary air present, would be diluted to such an extent as to be practically harmless. The Bureau of Mines has in several publications (notably in Bulletins 48 and 57, and Technical Paper 17) given data as to proper methods of blasting, selection of explosives, etc. However, numerous air samples at blasting faces in metal mines invariably reveal presence of dangerous gases, due generally to incomplete combustion, these dangerous gases being usually CO and oxides of nitrogen. Dangerous percentages (upwards of 1 per cent.) of CO have been obtained at drift faces in metal mines after blasting with explosives of ammonium nitrate as well as gelatin base, detoned with No. 8 as well as with No. 6 caps, fired electrically as well as by fuse, tamped and untamped.

The most dangerous gas found in fumes of explosives is CO, of which quantities up to and over 1 per cent. are frequently found in the general air around newly-blasted faces in metal mines, and frequently as much as two or three-tenths of 1 per cent. in air from muck piles several hours after blasting. This gas gives headache in air with proportions as low as 0.05 per cent., and is dangerous at 0.2 per cent., and quickly fatal when over 0.50 per cent. Another gas sometimes found is nitrous oxide, and its effect, while serious, is not likely to be so quickly fatal as that of CO. However, when dynamite burns instead of exploding, the nitrous oxide content of surrounding air may be sufficiently high to cause death to those breathing it. Other dangerous gases, such as H_2S, SO_2, etc., may also be found in explosive fumes, but rarely present in harmful proportions. However, straight nitroglycerine explosive dynamite gives off several times as much CO gas as gelatin or ammonium base explosive, hence straight nitroglycerine should *never* be used in the confined places found in mining.

It appears that, at least at present, there is no explosive applicable to metal mining in which there is any guarantee that formation of dangerous gases can be prevented in blasting, hence the one feasible preventive is effective ventilation.

Mechanical Ventilation.

It is significant that in 1919 the great coal-mining industry of the United States, which is compelled to give minute attention to ventilation, had but three deaths from suffocation from explosives fumes, though over 760,000 men were employed (see U. S. Bureau of Mines Bulletin 196), or about three times as many employes as in our metal mines. Metal mines only too frequently place entire reliance on natural ventilation or on compressed air, and both are likely to be inefficient, dangerous, and, in the long run, costly. A compressed-air blower will rarely deliver to a working face more than 100 to 150 cubic feet of air per minute. The cost is two to five cents per 1000 cubic feet, and there is danger that at least occasionally the compressed air may, through defective compressing system, be charged with dangerous gases. Ordinary ventilation methods by mechanical fans produce air circulation at a cost of about two to five cents per 1000 cubic feet, and, with proper supervision, will readily deliver several thousand cubic feet of air per minute to working faces, instead of the 100 or thereabouts cubic feet per minute by compressed-air blowers. For dead-end faces of drifts, crosscuts, raises, winzes and shafts small electrically driven fans direct connected to one-half to ten horse-power mo-

tors force air through canvas tubing or galvanized pipe and readily deliver 1000 to 5000 or more cubic feet of air per minute, or 10 to 50 times as much air as can be obtained from compressed-air blowers and at much less cost. These small fans and canvas-pipe or galvanized-pipe units not only remove explosive fumes from the face, but, if operated as blowers, will keep a stream of moving air at point where the machine man or mucker works, and in hot mines especially the workers' comfort and efficiency are greatly improved and his health and safety assured, at least as far as explosives fumes are concerned. Larger metal mines now recognize this, and many new mechanical ventilation installations in large metal mines are found, especially in the West, annd the time will soon be at hand when laws will demand efficient mechanical ventilation of metal mines as well as of coal mines, efficient ventilation consisting essentially of providing circulation of ample currents of fresh air at all places where men work underground.—*U. S. Bureau of Mines, Reports of Investigations.*

August Silver Coinage

Silver pieces to the number of 6,770,026, valued at $1,053,014, were coined at the various United States mints during August. Minor pieces coined totaled 55,092,000, valued at $954,920. A total of 1,145,000 silver 20-centavos was coined for Cuba.

1920 Iron Production

Total production of all kinds of pig-iron for the first six months of 1920 was 18,435,602 tons. This compares with 16,278,175 tons in the first six months of 1919 and 14,370,189 tons in the second half of 1919. The six months' figures would give an annual pig-iron production of 36,871,204 tons, or an approximate 16 per cent. increase over the 1919 production of 31,015,364 tons. The largest annual production was 39,434,797 tons in 1916, and the largest pre-war year was 1913, with 30,966,152 tons.

Of the total six months' production, basic pig-iron totaled 8,450,694 tons; Bessemer, 5,918,524 tons; foundry, 2,980,201 tons; malleable, 666,165 tons; forge, 168,869 tons, and all others, 251,149 tons. The basic pig-iron total of 8,450,694 tons compares with 7,910,295 tons for the first six months and 6,583,836 tons for the last six months of 1919. Bessemer's total of 5,918,524 tons compares with 5,181,621 tons and 4,794,313 tons for the first and last six months of 1919, respectively.

The total number of furnaces in blast on June 30, 1920, was 322, as compared with 280 on December 31, 1919. Pennsylvania took the lead with a total production of 7,241,726 tons, and Ohio was second with 4,130,811 tons. Alabama produced 1,225,236 tons. Statistics of iron made for sale or for use of the makers themselves show that 13,059,115 tons out of 18,435,602 tons, or 70 per cent., was for the latter purpose, and the balance, 5,376,487 tons, was made for sale.

TWO BUREAUS WORRY WHEN OPERATORS QUIT REPORTING

Various coal producers have become reluctant to submit to the Government reports of production and operating conditions on the ground that such reports may have a possible effect on the indictment case now pending at Indianapolis. Some of the coal men have stated that for this reason their reports no longer reflect actual conditions. The situation has become so serious that Secretary of the Interior Payne has sent the following letter to the Attorney-General:

"The Geological Survey is having difficulty in obtaining current reports of coal production and operating conditions at the mines because of a feeling on the part of coal operators that to continue rendering these reports as in the past would prejudice their position in the pending indictment before the Federal Courts at Indianapolis.

"O. G. Scott, secretary Central Illinois Coal Bureau, of Springfield, Ill., explaining his failure to submit the usual weekly report states: 'Many of our members discontinued their reports on advice of attorneys pending final settlement indictment cases at Indianapolis. Our reports no longer reflect the conditions.'

"The co-operative arrangement whereby the local operators' association collects reports from individual operators and transmits a consolidated report to the Survey at Washington, dates back to June, 1917.

"The weekly report, a copy of the latest issue of which I enclose, is built up on the basis of these operators' reports and has come to be recognized as an authoritative review of production and of the various causes limiting production. It was largely relied upon by the Fuel Administration and the Railroad Administration during the war period as a guide to the success of the efforts then made to increase production. Its importance was never greater than at the present moment, when the country is apprehensive as to its fuel supply. I therefore regard it as of great public importance that no interruption to the continuity of these reports be permitted.

"Permit me to ask, therefore, if it would not be possible for the Department of Justice to issue some sort of statement which would set at rest apprehension as to the legality of the collection and exchange of information of this particular character among operators through the medium of an association."

Palmer's Aide Replies

Henry S. Mitchell, acting assistant to the Attorney-General, replied to Secretary Payne as follows:

"The Attorney-General is in receipt of your letter of August 9, wherein you call attention to the difficulty experienced by the Geological

Survey in obtaining current reports of coal production and operating conditions at the mines because associations of operators which have compiled such reports and transmitted them to the Survey have taken the position, upon advice of counsel, that such reports should be discontinued because of legal proceedings instituted by the Department of Justice, including the indictments of coal operators now pending at Indianapolis, and you ask whether this department could not issue a statement which would set at rest the apprehensions of the operators.

"Of course this department has not taken the position that the collection of statistics as to production, or the transmission thereof to a governmental body, is obnoxious to the law, and I do not know of anything which would afford a real basis for the opinion that the department has taken that attitude.

"The department has taken the position in a number of legal proceedings that a combination or conspiracy amongst producers to limit production or enhance prices, upon the basis of statistics as to production or prices collected by a trade association, is a violation of the Federal anti-trust statutes; but there is nothing in that position inconsistent with the view that information of the character utilized by the Geological Survey may be collected and furnished to that body without using it as a basis for an unlawful restriction of production or enhancement of prices.

"I trust that the foregoing may constitute such a statement as you desired. If there is anything further that you wish done, please inform the department."

Sufficient time has not elapsed since the above interchange of correspondence to judge of its effect upon the regular submission of coal reports.

Commission Hindered

The Federal Trade Commission announced the possible suspension of monthly and quarterly bituminous coal-cost bulletins almost contemporaneously with the making of a statement by Secretary Payne to the effect that many coal operators were opposed to submitting production and operation reports. The commission based its position on the fact that operators were not reporting and that the monthly and quarterly bulletins no longer reflect accurately the true situation.

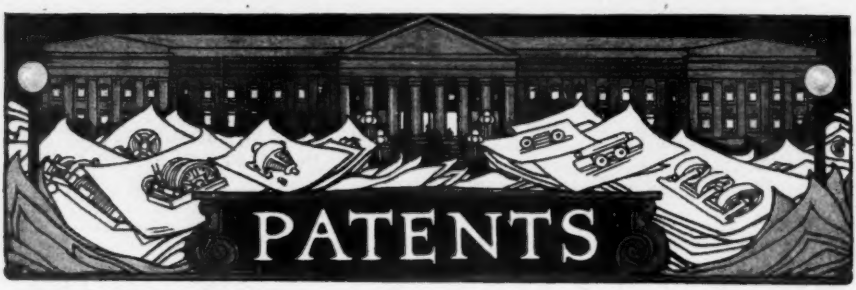
In 1918 as many as 2482 bituminous operators reported to the Fuel Administration. When the Federal Trade Commission in January, 1920, resumed the collection of information as to costs of bituminous production and operation they believed figures would be supplied by the operators, but only 1589 operators reported in January, 1431 for February, 1081 for March, 812 for April and 680 for May. The commission has announced that it will continue to receive for the benefit of its own records reports which may be submitted voluntarity by the operators, but that it will issue no more cost bulletins unless a sufficient number are received to reflect the entire situation.

BOLIVIA'S METAL RESOURCES INTEREST DR. FRANK L. HESS

The United States, having in the last few years become a smelter of tin, is interested in the report of Dr. Frank L. Hess of the United States Geological Survey, who has just returned to this country after an extended trip through the tin-producing districts of Bolivia. Dr. Hess believes that the tin industry of that country has expanded to the point where the labor supply has become a limiting factor which is rapidly growing serious. Bolivia's mineral production comes from an altitude in excess of 14,000 feet. Very little mining is done below the 12,000-foot level. There is a serious lack of proper housing facilities and fuel, and this, together with the rigorous climatic condition, has forced the population on the plateaus to the lower country, thus making the shortage of labor a question of great seriousness. Dr. Hess offers as a solution to this problem the bettering of living conditions so that the Indians of that region may be employed. He states that the American companies and others of the more progressive mining concerns have been taking good care of their own employes for several years. Welfare work, however, has not developed as rapidly as it should, and a great deal of work still remains to be done for the benefit of the entire population of the upper plateaus.

Dr. Hess was considerably interested in the development of the petroleum industry in Bolivia. It seems now a certainty that that industry will furnish a nearby supply of fuel oil. The Guggenheims have built a motor road from Eucaliptus to Caracoles, thereby demonstrating that automobile transportation is possible. The tin industry is constantly expanding and many new properties are being opened. Considerable prospecting is being done throughout the country. The whole of the famous Potosi hill is now being sampled, and it is expected will be developed on a very large scale, largely due to the price of silver, which has given unprecedented stimulus to that industry.

The tungsten properties of Bolivia are not being operated, but Dr. Hess believes that some of them can be operated at present prices. The impetus given this industry during the war proved beyond all question the value of the Bolivian tungsten deposits. Dr. Hess made the statement that he believes that tin deposition in Bolivia was governed by the same processes as govern deposition of tin in other places. He has made a considerable study of this industry, and his statement in this respect differs from opinions expressed by geologists who made earlier investigations of the problem.



1,345,453—*W. N. MacFarland,* Scranton, Pa.
Coal Separator, comprising a screen, trunnions at the ends of said screen intermediate the top and bottom thereof, and bearings for said trunnions permitting both transverse and oscillatory movement.

1,345,790—*Lionel Lodge,* Birmingham, England. Assigned to the Lodge Fume Co.
Electrical Precipitator for Gases, comprising plates forming channels for the gases, discharge electrodes situated transversely and longitudinally between the plates and deflectors for deflecting the gases towards the sides of the channels when passing longitudinally by the discharge electrodes.

1,345,835—*Giulio Clement,* Milan, Italy. Assigned to the Clements Gold Magneto Co.
Apparatus for Separating or Concentrating Fine Metals from Pulverized Material, comprising a hopper, an electric condenser consisting of a metallic sieve, a non-conductive surface, superposed wooden boards carrying said surface and insulated from one another, a metallic block secured to one of said boards, means for creating an electric current of high tension, an electric conductor connected to said blocks, another conductor connected to said metallic sieve and a spark gap for regulating the tension of the current.

1,345,846—*W. E. Greenawalt,* Denver, Col.
Process of Extracting Metals From Their Ores, involving leaching with acid to dissolve the copper, filtering, washing the residue, electrolyzing the rich solution, precipitating the lean solution with hydrogen sulfid, and using the copper sulfid precipitate to reduce the variable valent salts in the electrolyte.

1,345,861—*N. H. Kuryla,* Park City, Utah. Assigned to the Merrill Company.
Filtering Apparatus, comprising a chamber open at its top and bottom, and filtering elements therein, closures for the top and bottom of the chamber, and means for equalizing the pressure of the closures on the chamber.

1,345,991—*P. B. Brown,* Shenandoah, Pa.
Power Mine Shovel.

1,346,175—*M. H. Caron,* Weltevren, Java, Dutch East Indies.
Process of Recovering Nickel from nickel silicate ores, the steps which consist in subjecting the ore to a preparatory reducing roast and cooling the reduced ore under non-oxidizing conditions.

1,236,286—*L. V. Waterhouse,* Queenstown, Tasmania, Australia.
Flotation Apparatus, comprising baffling means located in the vessel, a dash pot adjacent to the floor of the vessel, frothing fluid delivering means having a discharge opening adjacent to the dash pot and below the baffling means, the stream of fluid discharging downwardly towards the dash pot.

1,346,316—*C. L. Hill,* Lancaster, Pa.
Process of Bleaching Asbestos, consisting of subjecting the fibers to the action of an acid in a gaseous condition in the presence of moisture and then washing the fibers to remove soluble salts.

1,346,610—*F. N. Smith,* Chicago, Ill.
Dry Separator.

1,346,817—*Rudolph Gahl,* Miama, Ariz. Assigned to Pneumatic Process Flotation Co.
Flotation Apparatus, comprising a tank divided into frothing compartments by partitions not reaching down to the bottom of the tank, a concentrates delivery and a whole flow tailings discharge extending upwardly from the bottom of the tank beyond a frothing compartment.

1,346,818—*Rudolph Gahl,* Miami, Ariz. Assigned to Pneumaitc Process Flotation Co.
Flotation Apparatus, comprising a receptacle having an impervious bottom, a series of independently removable foraminous air chambers located near the bottom and having longitudinal extending upper surfaces.

1,346,819—*Rudolph Gahl,* Denver, Col. Assigned to Pneumatic Process Flotation Co.

Flotation Process, consisting in introducing additional sand into the normal pulp and subjecting the mixture to froth flotation.

1,346,939—*Robert E. Carmichael,* Damon, Tex.

Method of Sampling Oil Wells.

1,346,966—*S. N. Mighell,* Chicago, Ill.

Coal-mining Machine.

1,347,000—*E. C. Washburn,* Englewood, N. J.

Thawing Apparatus for Coal, comprising a track, means enclosing a space about the track and adapted to retain heated air therein by its buoyancy, and a track portion inclined downwardly under said enclosing means and then upwardly to join said first track portion.

1,347,026—*H. H. Godfrey,* Los Angeles, Cal.

Ore Concentration Table, inclined longitudinally and transversely, said table being covered with cathode, and an anode spaced above said cathode.

1,347,088 and 1,347,089—*W. E. Greenawalt,* Denver, Col.

Electrolytic Apparatus.

1,331,334—*Samuel Field,* London, England; assigned to Metals Extraction Corporation, London.

Purification of Zinc Solutions obtained by the treatment of zinc ores or zinc containing materials with sulphuric acid which comprises treating the solution while agitated and at a temperature of 80 to 100 degrees Cen. with ozonized air in presence of a mixture of manganese dioxid and lead dioxid produced in the electrolysis with lead anodes of a zinc solution containing manganese.

1,331,740—*Edward S. Berglund,* Trollhattan, Sweden; assigned to Sven Huldt, Stockholm, Sweden.

Treating Zinc Powder within the condenser to cause the liquid zinc particles to unite by subjecting them to rubbing and pressure by the aid of a rotating screw located in the mixture and then forcing the powder through an opening to compress it.

1,331,883—*Francis L. Stuart,* New York.

Coal-Storing System consisting of a particular arrangement of conveyors, bins and tracks.

1,331,964—*Ray C. Newhouse,* Milwaukee, Wis.; assigned to Allis-Chalmers Co.

Grinding Mill of the tube and ball type in which, instead of a ball, the comminuting body is formed with spherical outer zone surfaces so that the universal rolling and uniform wearing effect is maintained, while the greater surface co-action is secured by providing spherical concave end surfaces adapted for co-action with the outer zone surfaces of adjacent bodies.

1,331,968—*Clifford J. Tomlinson,* West Allis, Wis.; assigned to Allis-Chalmers Co.

Impact Pulverizer in which the hammer or bail comprises a pair of spaced radial arms and a cross-bar detachably secured to corresponding ends of said arms.

1,331,969—*Clifford J. Tomlinson,* West Allis, Wis.; assigned to Allis-Chalmers Co.

Rotary Impact Pulverizer of the type in which there are a pair of spaced rotors having opposed impact surfaces and which are caused to rotate in the same direction.

1,332,152—*Henry Aldner,* Milwaukee, Wis.; assigned to Allis-Chalmers Co.

Roasting Furnace of the McDougall type in which means are provided for readily detaching the rabble arms, and also for cooling them.

PATENT OFFICE BUSINESS SHOWS RECORD INCREASE

An extraordinary increase in business was made by the United States Patent Office during the fiscal year ended June 30. There were 81,948 applications for inventions filed, as compared with 62,755 during the previous year. The total number of applications of all kinds was 102,940, which is 27,283 more than were filed during the year 1919. The number of patents granted and trade-marks, labels and prints registered was 47,409, an increase of 4056 over the preceding fiscal year.

Cash receipts from all sources, the largest item of which was for first fees in connection with applications, amounted to $2,615,697.33. Total expenditures were $2,436,561.37, leaving a net surplus of $179,135.96. The total net surplus to date is $8,305,023.56. In 1918 and 1919 expenditures exceeded receipts by $27,955.62 and $65,228.13, respectively.

The large increase of business is reflected in the net surplus of receipts during the past fiscal year.

The office shipped to foreign Governments 999,862 copies of patents. It received for record 40,188 deeds of assignment. One of the items which make up the large increase in the volume of business of the office is applications for the registration of trade-marks, in which a gain of 72 per cent. over the number received during the preceding fiscal year is recorded.

The gain in actual numbers of applications filed far exceeded any previous increase of business in any one fiscal year, and this gain is larger than the total receipts of any calendar year in the history of the Patent Office up to and including the year 1881.

RESERVE BOARD REFRAINS FROM CLASSIFYING CREDITS

Because of circulation of reports that the Federal Reserve Board would classify certain lines of credit as essential and others as non-essential, and instruct banks to observe the classification, Governor Harding has issued the following denial:

"The Federal Reserve Banks are adhering consistently to the policies outlined on frequent occasions during the past year, and there is little to say except to reiterate statements already made. The Federal Reserve Board has never undertaken to classify any business or industry as essential or non-essential and does not intend to do so. In a statement published immediately after the conference last May with members of the Federal Advisory Council and the banker directors of the Federal Reserve Banks the policies of the Federal Reserve System were fully explained. The Board is convinced that these policies are wise and salutary, and is confident that results will demonstrate their soundness."

Chamber of Commerce Review

The September financial review of the Chamber of Commerce of the United States contains the following comment upon minerals and metals:

"Whether mining is busy and prosperous or the reverse, depends upon the nature of the metal. Gold mining still suffers from high cost of production and the stationary price of gold. Silver mining feels the effect of the decline in the price of silver. The price of zinc is low, and the demand not equal to the possibility of supply. Lead is higher because of increased demand. Copper is dull because of a supply not yet disposed of. Iron mining is good. Phosphate mines in the South are doing well after many lean years.

"Contraction in financial credits has put 'wildcatting in the oil regions out of business which makes business there dull because supplies for drilling oil wells are no longer called for.

"Coal mining, as usual, has its flock of troubles—strikes and lack of cars being the principal ones. But they are enough. How the consumers and the business world regard the near future (the remainder of the year) seem to be largely a matter of local conditions."

Alaska Chapter Elects Officers

The regular meeting of the Alaska Chapter, American Mining Congress, was held at Fairbanks, July 3. The old board of directors was re-elected, as follows: Messrs. Burns, Collins, Conradt, Crites, Davis, Gross, Haney, Hess, Hopkins, Howell, Johnson, Kinney, McQuarrie, Pearson and Thompson.

The board of directors held a meeting July 29 and elected the following officers: Governor, John A. Davis; vice-governors, August Conradt, G. A. McQuarrie and L. C. Hess; treasurer, Paul Hopkins; secretary, K. T. Sparks; executive committee, Paul Hopkins, J. C. Kinney and Ben Thompson.

The following directors were present; Messrs. Davis, Gross, Conradt, Collins, McQuarrie, Kinney, Thompson, Hopkins and Hess.

—Reported by K. T. SPARKS, Secretary.

Industrial Notes

The Shourds-Stoner Company, Inc., architects and engineers, announce the opening of an additional office at 825 Harris Trust Bldg., Chicago, Ill. This office is in conjunction with their present one at Terre Haute, Ind., and was required through the large and growing business of this company throughout the central States, of which Chicago is the natural metropolis. A complete department handling all phases of engineering work as pertains to the coal industry is maintained by this company. In addition to its civil, mechanical, electrical and architectural engineering departments is a department specializing in appraisals and valuations. They have recently secured several contracts of magnitude in this line. They would be pleased to have all their old friends and clients call on them at their new office.

PERSONALS

J. H. Holmes, Jr., of Boulder, Col., who has been spending several weeks in New York and Washington, has returned to Colorado.

Judge E. E. Sapp, after a short trip to Washington and Eastern points, has returned to his home at Galena, Kan.

Ravenal Macbeth, secretary of the Idaho Mining Association, is again in Washington, where he will remain at the Arlington Hotel indefinitely.

J. F. Callbreath, secretary of The American Mining Congress, has returned to Washington after attending the Lake Superior meeting of the American Institute of Mining and Metallurgical Engineers.

Col. Warren R. Roberts, chairman of the coal section of the Standardization Committee of The American Mining Congress, left Chicago on September 4 for a trip to Western Canada, where he will remain for several weeks. Colonel Roberts is president of Roberts & Schaefer Co., Chicago, Ill.

Wade Kurtz has returned to his home at Kansas City after a trip to Washington on tax matters.

H. N. Lawrie, economist of The American Mining Congress, is again at Washington headquarters after an extended trip through the gold camps of the country.

Dr. Henry Mace Payne, formerly assistant to the president of the Bertha Coal Co., has resigned that position to take the management of the Douglas-Barnes Corporation at 53d street and Fifth avenue, New York city.

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Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Hendrie & Bolthoff Mfg. & Supply Co., Denver, Colo.
Worthington Pump & Machinery Corp., 115 Broadway, New York City.

AMALGAMATORS
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Mine & Smelter Supply Co., Denver, Colo.
Mine Equipment & Supply Co., Denver, Colo.

ARMATURES
Westinghouse Elec. & Mfg. Co., East Pittsburgh, Pa.

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Shourds-McCormick Co., Inc., Terre Haute, Ind.

ASBESTOS PRODUCTS
Mikesell Bros. Co., 156 North La Salle St., Chicago, Ill.

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Ledoux & Co., Inc., 99 John St., New York.
Lucius Pitkin, Inc., 47 Fulton St., New York City.
Pennsylvania Smelting Co., Pittsburgh, Pa.
W. L. Piers, 428 18th St., Denver, Colo.
Thompson Balance Co., Denver, Colo.

AUTOMATIC CAR CAGERS
Connellsville Mfg. & Mine Supply Co., Connellsville, Pa.

AUTOMATIC COAL SKIP
Jacobsen & Schraeder, Inc., Marquette Bldg., Chicago, Ill.
Roberts & Schaefer Co., McCormick Bldg., Chicago, Ill.

AUTOMATIC (Mine Doors, Truck and Electric Switches)
American Mine Door Co., Canton, Ohio.
Dinwiddie Steel & Mfg. Co., St. Louis, Mo.

BALANCES
Ainsworth & Sons, Wm., Denver, Colo.
Mine & Smelter Supply Co., Denver, Colo.
Thompson Balance Co., Denver, Colo.

BALLS (For Ball Mills)
Mine Equipment & Supply Co., Denver, Colo.
Mine & Smelter Supply Co., Denver, Colo.

BALL MILLS
Hendrie & Bolthoff Mfg. & Supply Co., Denver, Colo.
Mine Equipment & Supply Co., Denver, Colo.
Worthington Pump & Machinery Corp., 115 Broadway, New York City.

BEARINGS (Roller)
Hyatt Roller Bearing Co., 100 W. 41st St., New York, N. Y.

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Chicago Belting Co., Chicago, Ill.
H. Channon Co., Chicago, Ill.
Goodrich Co., B. F., Akron, Ohio.
Jeffrey Mfg. Co., 958 N. Fourth Avenue, Columbus, Ohio.
Link-Belt Co., 910 S. Michigan Ave., Chicago, Ill.
U. S. Rubber Co., New York City.

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Chicago Belting Co., Chicago, Ill.
U. S. Rubber Co., New York City.
Mine & Smelter Supply Co., Denver, Colo.

BINS (Coke and Coal)
Jeffrey Mfg. Co., Columbus, Ohio.
Link-Belt Co., 910 S. Michigan Ave., Chicago, Ill.

BIT SHARPENERS
Denver Rock Drill Mfg. Co., Denver, Colo.

BLASTING SUPPLIES
Atlas Powder Co., Wilmington, Del.
du Pont Powder Co., The E. I., Wilmington, Del.
Equitable Powder Co., East Alton, Ill.
Hercules Powder Co., Wilmington, Del.
Illinois Powder Co., St. Louis, Mo.

BLOWERS
General Electric Co., Schenectady, N. Y.

BOILERS
Allis-Chalmers Mfg. Co., Milwaukee, Wis. (feed pump).
Hendrie & Bolthoff Mfg. & Supply Co., Denver, Colo.
Mine Equipment & Supply Co., Denver, Colo.

BOLTS (Expansion)
Electric Service Supplies Co., 17th and Cambria Sts., Phila., Pa.

BRATTICE CLOTH
H. Channon Co., Chicago, Ill.
Mikesell Brothers Co., 156 N. La Salle Street, Chicago, Ill.

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Jeffrey Mfg. Co., Columbus, Ohio.
Vulcan Iron Works, Wilkes-Barre, Pa.
Westinghouse Elec. & Mfg. Co., East Pittsburgh, Pa.
Wilmot Engineering Co., Hazleton, Pa.

BRIDGES
Stupp Bros. Bridge & Iron Co., St. Louis, Mo.

BRIQUETTING MACH.
General Briquetting Co., 25 Broad Street, New York City.
Jeffrey Mfg. Co., Columbus, Ohio.

BUCKETS (Clam Shell)
Link-Belt Co., 910 S. Michigan Ave., Chicago, Ill.
Machinery Warehouse & Sales Co., Old Colony Bldg., Chicago.

BUCKETS (Elevator)
Jeffrey Mfg. Co., Columbus, Ohio.
Link-Belt Co., 910 S. Michigan Ave., Chicago, Ill.
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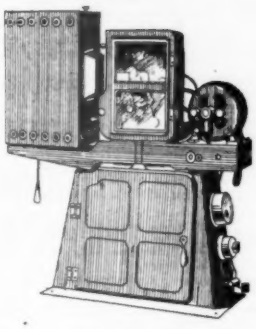

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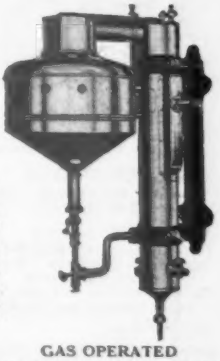

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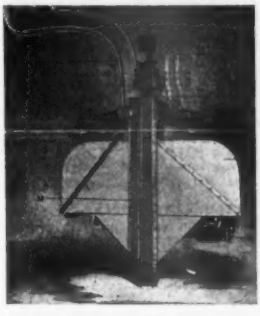

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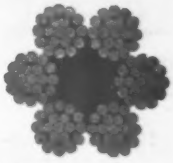

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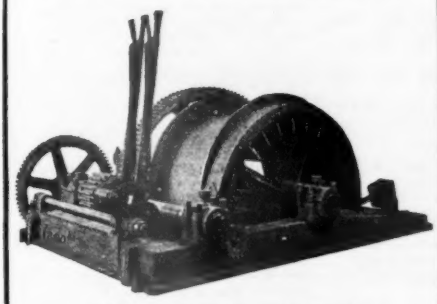

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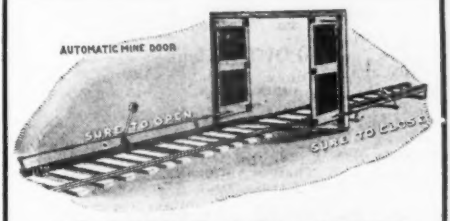

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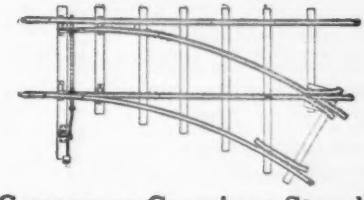

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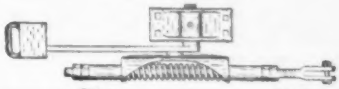

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INDEX TO ADVERTISERS

	Page
Allison Coupon Co.	47
Allis-Chalmers Manufacturing Co.	20
American Cyanamid Co.	4
Ameling Prospecting Co., H. R.	53
American Mine Door Co.	51
American Pulverizer Co.	49
American Steel & Wire Co.	19
Anaconda Copper Mining Co.	16
Automatic Reclosing Circuit Breaker Co.	47
Atlas Car & Manufacturing Co.	13
Atlas Powder Co.	26
Bardwell, Alonzo F.	57
Barrett Company, The	45
Beach & Co.	57
Bertha Coal Co.	49
Boyle, Jr., John	57
Burlingame, Walter E.	57
Business Men's Clearing House	49
Car Dumper & Equipment Co.	15
Central Frog & Switch Co.	51
Channon Manufacturing Co., James H.	35
Chicago Belting Co.	Cover
Chicago Perforating Co.	57
Connellsville Manufacturing & Mine Supply Co.	43
Crane Company, The	34
Deister Concentrator Co., The	41
Deming Company, The	55
Denver Engineering Works Co.	51
Denver Rock Drill Manufacturing Co.	17
Dings Magnetic Separator Co.	45
Dinwiddie Steel & Manufacturing Co.	14
Du Pont de Nemours Company, E. I.	27
Edison Storage Battery Co.	Cover
Electrical Material Co.	53
Electric Railway Equipment Co.	47
Federal Sign System (Electric)	9
General Briquetting Co.	41
General Naval Stores Co.	19
Giant Powder Co.	29
Goodman Manufacturing Co.	21
Goodsell Specialty Co.	57
Grasselli Chemical Co.	25
Hamilton, Beauchamp, Woodworth	60
Hercules Powder Co.	28
Herman, John	57
Hoffman Bros.	57
Hockensmith Wheel & Mine Car Co.	39
Holmes & Bros., Robert	17
Hunt & Co., Robert W.	60
Hyatt Roller Bearing Co.	3
Illinois Powder Manufacturing Co.	55
Illinois Zinc Co.	60
Indiana Laboratories Co.	57
Ingersoll-Rand Company	8
Ironton Engine Co.	13
Irvington Smelting & Refining Works	60
Jeffrey Manufacturing Co., The	Cover
Koppers Company, The	6
Lalor Company, W. M.	39
Ledoux & Co.	60
Lehigh Coal & Navigation Co.	59
Leschen & Sons Rope Co., A.	14
Lidgerwood Manufacturing Co.	18
Link-Belt Company	62
Longyear & Co., E. J.	60
Ludlow-Saylor Wire Co., The	21
Mancha Storage Battery Locomotive Co.	22
Midwest Steel & Iron Works Co.	57
Mikesell Bros. Company	57
Mine Equipment & Supply Co.	55
Mine Safety Appliances Co.	45
Morse Chain Co.	11
Mudd, Seeley W.	57
Myers-Whaley Company	23
National Fuse & Powder Co.	55
Nicholson & Co., W. H.	57
New York Engineering Co.	15
Officer & Co., R. H.	57
Ohio Brass Co.	43
Ohio Smelting & Refining Co., The	53
Ottumwa Box Car Loader Co.	39
Oxweld Acetylene Co.	37
Pennsylvania Smelting Co., The	53
Phelps Dodge Corporation	60
Piers, W. L.	57
Prox Company, Frank	41
Read Company, R. G.	57
Roberts & Schaefer Co.	30
Roebling's Sons Company, John A.	45
Roessler & Hasslacher Chemical Co.	24
Scaife & Sons Co., William B.	53
Shourds-Stoner Company	55
Southwestern Engineering Co.	51
Standard Oil Co.	22
Stephens-Adamson Manufacturing Co.	36
Stimpson Equipment Co.	60
Stonehouse Steel Sign Co., The	53
Streeter-Amet Weighing & Recording Co.	49
Thompson Balance Co.	41
Thorne, Neale & Co.	59
Union Assay Office	57
Union Electric Co.	39
United Filters Corporation	43
United Iron Works Co.	41
United Metals Selling Co.	16
Vulcan Iron Works	7
Watt Mining Car Wheel Co.	18
Wellman-Lewis Company	49
Wellman-Seaver-Morgan Company	12
Westinghouse Electric & Manufacturing Co.	32
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Wilmot Engineering Co.	53
Worthington Pump & Machinery Corp.	10

Correct Screening

A LINK-BELT WEST VIRGINIA INSTALLATION

CORRECT screening in Link-Belt language means delivering properly sized coal—the best that can be secured from the vein being worked.

Our designs provide correct screening for the whole range of American coal production. They meet the individual conditions and requirements in each case—they are built to the same high standards, characteristic of all Link-Belt products.

For nearly half a century the Link-Belt Company has been the leader in the development of efficient, economical equipment for the production of coal at the mine.

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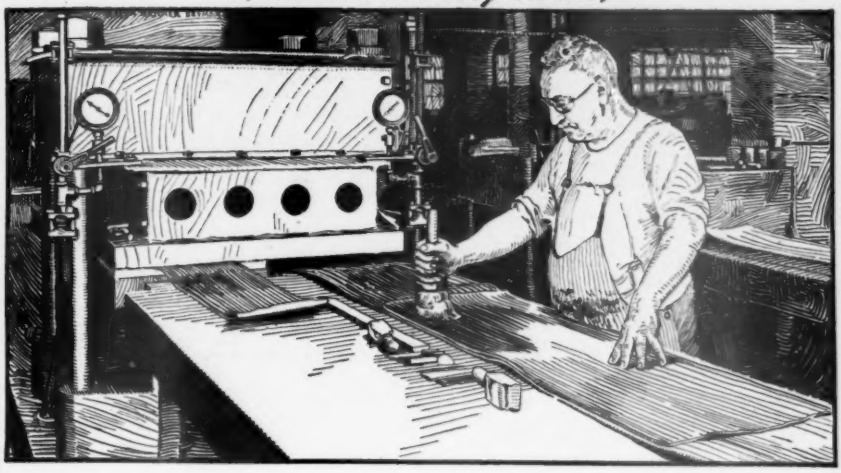
Coal Handling Equipment

Leather Belting May Be Down But It Is *Never* Out

(and it is rarely down)



EVERY good leather belt, regardless of its age or condition has an appreciable value not to be found in substitute belts. No matter how old or how worn, it still has years of useful life and retains an appreciable percentage of its original dollars and cents value. Old leather belting can be made into new belts—large belts cut into many smaller belts, and belts worn by years of service rebuilt. The belts thus made over or rebuilt are practically as good as new with a long and useful life still in them.

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Send for these booklets

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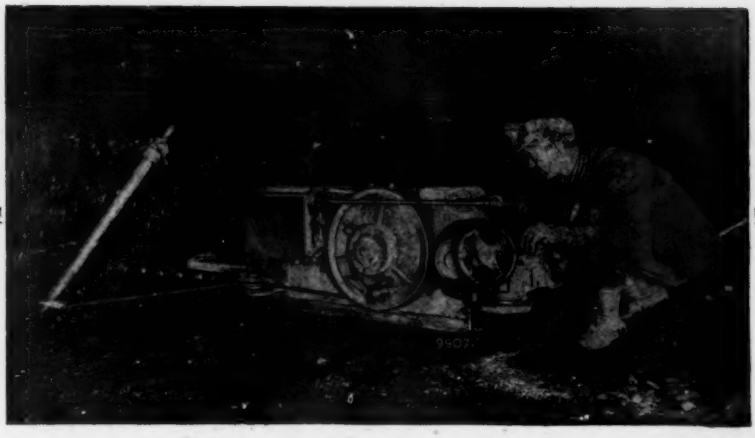

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3. Indestructible Machinery Steel Cutter Bar with Renewable Hardened Liners.
4. Separate Power-Driven Rope Drums.
5. Disc Clutch for Controlling Feed and Handling Drums.
6. Convenient to Operate.
7. Simple and Compact in Design.
8. Starting Box of the Controller Type, Similar to a Locomotive Controller.

Catalog No. 241-G fully describes the Jeffrey 35B Machine and the Handi-Truck.

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